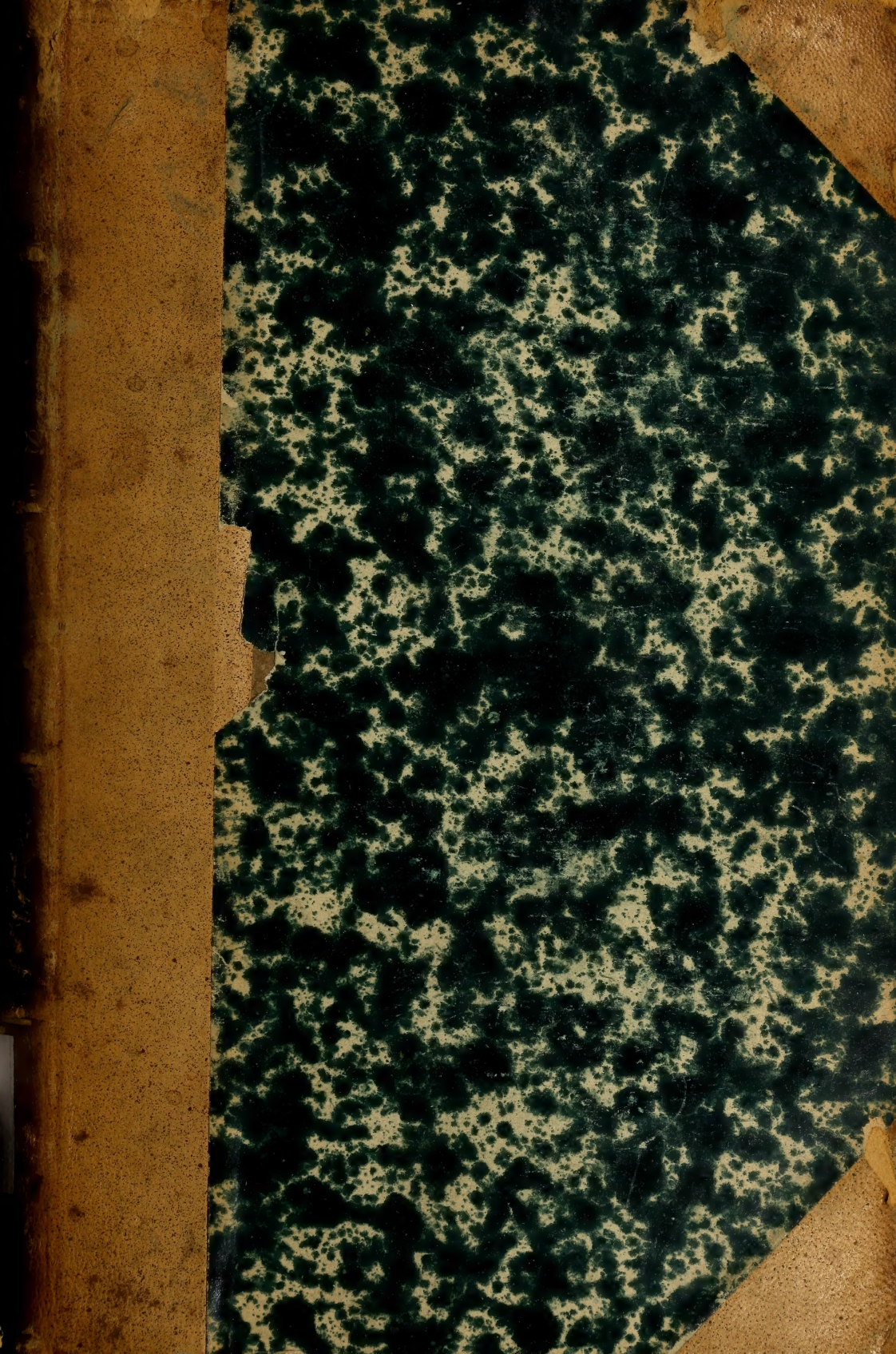






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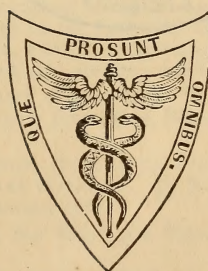
FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA; MEMBER OF
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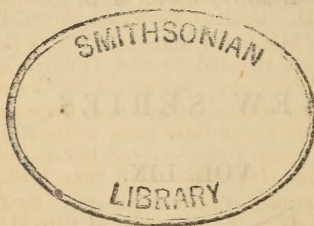


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TO READERS AND CORRESPONDENTS.

All articles intended for the *Original Department* of this Journal must be contributed to it *exclusively*. The insertion elsewhere of *abstracts* of papers read before societies *prior* to the publication of the entire article in this Journal is a violation of this rule. As original articles are *accepted only on this condition*, we consider those who favour us with contributions to be bound in honour to conform to it.

Contributors who wish their articles to appear in the next number, should forward them before the 1st of February.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies will be furnished to authors, *if the request for them be made when the communication is sent*.

The press of original articles has compelled us to postpone several bibliographical notices prepared for this number.

Communications postponed for want of room shall receive early attention.

The following works have been received:—

Saint Bartholomew's Hospital Reports. Edited by Dr. ANDREW and Mr. CALLENDER. Vol. V. London: Longmans, Green & Co., 1869.

The Liverpool Medical and Surgical Reports. October, MDCCCLXIX. Edited by P. M. BRAIDWOOD, M. D., and REGINALD HARRISON, F. R. C. S., Assist. Surg. to the Royal Infirmary. London: John Churchill & Sons, 1869.

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A Practical Manual of the Diseases of Children. With a Formulary. By EDWARD ELLIS, M. D., Phys. to Victoria Hospital for Sick Children, late Phys. to Samaritan Hospital for Women and Children, etc. London: John Churchill & Sons, 1869.

Injuries and Diseases of the Knee-joint, and their Treatment by Amputation and Excision contrasted. The Jacksonian Prize Essay of the Royal College of Surgeons of England for 1865. By WILLIAM PAUL SWAIN, F. R. C. S., Surg. to the Royal Albert Hospital, Devonport. London: John Churchill & Sons, 1869.

The Pathology and Therapeutics of Mental Diseases. By J. L. C. SCHROEDER VAN DER KOLK, Prof. of Physiology in the University of Utrecht. Translated from the German by JAMES T. RUDALL, Fell., by examination, of the Roy. Coll. of Surg. of Eng.; Surg. to the Melbourne Hosp., etc. etc. London: John Churchill & Sons, 1869.

A Contribution to the Theory of Diathesis. By DAVID J. BRAKENRIDGE, M. D., F. R. C. P. E., Phys. to New Town Dispensary, Edinburgh. Edinburgh: Maclachlan & Stewart, 1869.

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The New Treatment of Snake-Bite, with Plain Directions for Injecting. By GEORGE BRITTON HALFORD, M. D., M. R. C. P. Lond., etc. etc. Melbourne, 1869.

The Pathology and Treatment of Stricture of the Urethra, and Urinary Fistulæ. By Sir HENRY THOMPSON, F. R. C. S., Surg.-Extraordinary to H. M. the King of the Belgians; Prof. of Clin. Surg., and Surg. to Univ. Coll. Hosp. From the third and revised London edition. With illustrations. Philadelphia: Henry C. Lea, 1869.

A Handy-Book of Ophthalmic Surgery for the Use of Practitioners. By JOHN Z. LAURENCE, F. R. C. S., M. B. (Univ. Lond.), Surg. to Ophthalmic Hosp., Southwark; Ophthalmic Surg. to St. Bartholomew's Hospital, etc. etc. Assisted by ROBERT C. MOON, late Asst. Surg. to Ophthalmic Hosp., Southwark. With numerous illustrations. Second ed., revised and enlarged by J. Z. LAURENCE. Philadelphia: Henry C. Lea, 1869.

On the Wasting Diseases of Infants and Children. By EUSTACE SMITH, M. D. Lond., M. R. C. P., Phys.-Extraordinary to H. M. the King of the Belgians, etc. etc. Philadelphia: Henry C. Lea, 1870.

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The Pathology of Bright's Disease. By WM. B. LEWIS, M. D., Lecturer on General Pathology in Med. Dep. of Univ. of City of New York, etc. With illustrations. New York, 1869.

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The History of Four Cases of Chronic Inversion of the Uterus, with the Account of an Operation designed as a Substitute for Amputation. By T. GAILLARD THOMAS, M. D., Prof. of Obstetrics in Coll. of Physicians and Surgeons, New York.

List of Medical Officers, U. S. A., with their Stations, as reported to the Surgeon-General of the Army, October 1, 1869, or at date of last report received.

Pepsin: its Physiological and Therapeutical Actions. Remarks made before the New York Medical Journal Association. By J. S. HAWLEY, A. M., M. D., Greenpoint, N. Y.

A Contribution to the Physiological Study of Veratrum Viride and Veratria (with experiments on lower animals, made at La Grange Street Laboratory, 1869). By R. AMORY, M. D., and S. G. WEBER, M. D. Boston: David Clapp & Son, 1869.

On the Treatment of Uterine Catarrh. By JOSEPH KAMMERER, M. D., Phys. to the German Hospital and Dispensary, New York. New York, 1869.

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The Nomenclature of Diseases. Drawn up by a Joint Committee appointed by the

Royal College of Physicians of London. Reprinted by order of the American Medical Association. Philadelphia, 1869.

Modern Treatment of Acute Internal Inflammations. By WM. A. B. NORCOM, M. D., of Edenton, N. C.

Address delivered by ISAAC RAY, M. D., of Philadelphia, on the Occasion of Laying the Corner-Stone of the State Hospital for the Insane at Danville, Pa., August 26, 1869. Harrisburg, 1869.

An Address Commemorative of Reuben Dimond Mussey, M. D., LL. D. By A. B. CROSBY, A. M., M. D., Prof. of Surgery in Dartmouth Med. Coll. and in Med. Depart. of Univ. of Vermont. Manchester, 1869.

Address of ALEXANDER DUNLAP, A. M., M. D., at the Twenty-fourth Annual Meeting of the Ohio State Medical Society, June, 1869. Columbus, 1869.

A Consideration of some of the many Popular Errors in Regard to Medicine and Medical Practitioners. An Introductory to the Course of Lectures in the Missouri Med. College, delivered Oct. 11, 1869. By PAUL F. EVE, M. D., Prof. of Surgery, etc.

Minutes of the Proceedings of the South Carolina Medical Association, at the Meeting convened in Charleston, for the Purpose of Reorganization, May, 1869, together with the Constitution as then revised. Charleston, 1869.

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Proceedings of the Academy of Natural Sciences of Philadelphia. May, June, July, 1869.

Report of the Committee on Intemperance as a Disease. Read before the Medical Society of the State of Pennsylvania, at Erie, June 9, 1869. Philadelphia, 1869.

Report of the Committee on Medical Education. (Extracted from the Transactions of the American Medical Association.) Philadelphia, 1869.

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First Annual Report of the Brooklyn Eye and Ear Hospital. Brooklyn, 1869.

Report of the Board of Directors of the Eastern Lunatic Asylum for the Fiscal Year ending September 30, 1869. Richmond, 1869.

Reports of the Trustees and Superintendent of the Tennessee Hospital for the Insane. Presented to the General Assembly, Nov. 17, 1869. Nashville, 1869.

The following Journals have been received in exchange :—

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Archiv für Anatomie, Physiologie, und Wissenschaftliche Medicin. 1869. Heft IV.

Deutsches Archiv für Klinische Medicin. Sechster Band, Zweites und Drittes Heft. 1869.

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Giornale Italiano delle Malattie Veneree e delle Malattie della Pelle. 1869. Settembre, Ottobre.

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Le Mouvement Médical. 1869. Nos. 38 to 49.

La Santé Publique. 1869. Nos. 35 to 47.

L'Union Médicale. 1869. Nos. 85 to 143 inclusive, except Nos. 124, 125, 126, 127.

Journal de Médecine Mentale. Septembre, Octobre, Novembre, 1869.

Gazette Hebdomadaire de Médecine et de Chirurgie. 1869. Nos. 36, 37, 38, 39, 42.
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 La Tribune Médicale. 1869. Nos. 104, 112.
 The British and Foreign Medico-Chirurgical Review. October, 1869.
 The Medical Times and Gazette. October, November, December, 1869.
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 The Lancet. October, November, December, 1869.
 The Practitioner. October, November, December, 1869.
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 The Indian Medical Gazette. September, 1869.
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 Half-Yearly Compendium of Medical Science. July, 1869.
 The Cincinnati Lancet and Observer. October, November, December, 1869.
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 The Western Journal of Medicine. October, November, 1869.
 The Chicago Medical Examiner. October, November, December, 1869.
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 The Saint Louis Medical and Surgical Journal. November, 1869.
 The Detroit Review of Medicine and Pharmacy. October, November, 1869.
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 The Pacific Medical and Surgical Journal. October, November, 1869.
 The California Medical Gazette. October, November, December, 1869.
 The Medical Bulletin. October, November, 1869.
 The New Orleans Journal of Medicine. October, 1869.
 The Richmond and Louisville Medical Journal. November, December, 1869.
 The Nashville Journal of Medicine and Surgery. October, Nov., Dec., 1869.
 The Galveston Medical Journal. September, 1869.
 The Journal of the Gynecological Society of Boston. Oct., Nov., Dec., 1869.
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 The Druggists' Circular. October, November, December, 1869.
 The Journal of Materia Medica. October, November, 1869.
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 The American Journal of Science and Arts. November, 1869.
 The American Naturalist. November, 1869.
 The Dental Cosmos. October, November, December, 1869.
 The American Journal of Dental Science. October, November, 1869.
 The Boston Journal of Chemistry. October, November, December, 1869.

Communications intended for publication, and Books for Review, should be sent *free of expense*, directed to ISAAC HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, London; or M. Hector Bossange, Lib. quai Voltaire, No. 11, Paris, will reach us safely and without delay.

All remittances of money and letters on the business of the Journal should be addressed exclusively to the publisher, Mr. H. C. Lea, No. 706 Sansom Street.

The advertisement sheet belongs to the business department of the *Journal*, and all communications for it must be made to the publisher.

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XI. The Science and Art of Surgery. Being a Treatise on Surgical Injuries, Diseases, and Operations. By John Eric Erichsen, Senior Surgeon to University College Hospital. From the fifth enlarged and carefully revised London edition. Illustrated with 630 engravings on wood. With additions by John Ashhurst, Jr., A. M., M. D., Surgeon to Episcopal Hospital, etc. etc. Royal 8vo. pp. 1228. Philadelphia: Henry C. Lea, 1869.	171
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3. Transactions of the Medical Society of the State of Pennsylvania, at its Twentieth Session, held at Erie, June, 1869. 8vo. pp. 310.	
4. Proceedings of the Georgia Medical Association, 1868.	
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THE
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ART. I.—*On the Effect of Opium and its Derivative Alkaloids.* By S. WEIR MITCHELL, M. D., Member of the National Academy of Sciences. (Read before the Biological and Microscopical Section of the Academy of Natural Sciences, March 1, 1869, and recommended for publication in the American Journal of the Medical Sciences.)

IN the number of this journal for January, 1869, I recorded certain experiments which seemed to prove for pigeons an almost entire immunity from the influence of opium and morphia. Twenty-one grains of powdered opium, given internally; or, large doses of acet. opii under the skin; or, two grains of sulph. morphia used hypodermically, alike failed to produce any notable influence.

Repeating these experiments, Dr. B. W. Richardson, of London, attained similar results.

Two grains of acetate of morphia dissolved having been injected by this observer in three localities under the skin of a pigeon, the pupils were unaltered, the breathing somewhat slow and laboured, and the heart reduced in power. At the fifteenth minute slight emesis took place, and the temperature fell four degrees. For a half hour longer the bird seemed inclined to droop its head, but no further phenomena due to opium were perceptible.

In a second experiment a pigeon took on the first day 21 grains of solid opium; on the second day, 30 grains; on the third day 40 grains, and on the fourth 50 grains in one dose. The temperature did not fall one degree, and no other symptoms of poisoning occurred.

Dr. Richardson, after thus fully confirming my results, makes certain suggestions, pointing out the direction which should be followed in pursuing this research. These concern the relative susceptibility of other and especially carnivorous birds, the capacity of other alkaloids to poison

pigeons, and the reason why they escape the usual effects of opium. Some of these questions I had already set myself to answer, and, in the course of inquiry, others arose of equal or greater interest, and are more or less sufficiently replied to in the present paper.

The amount of opium which a pigeon may swallow without loss of life is so great as to enable me to assert that it is next to impossible to kill it in this manner. Dr. Richardson has compared in the following passage the relative susceptibility of the pigeon and the child of one year old.

"It is clear," he says, "that a pigeon can receive at once as much opium as would produce dangerous, or even fatal symptoms, if divided equally and administered to twenty children under one year old, the weight of the bird itself being at least fifteen times less than that of each child, or 200 times less than the combined weight of the children.

Expt.—In February, 1869, desirous of learning whether it was possible to kill the pigeon with ingested opium, I chose a large bird, two years old, and gave him every day ten grains of aqueous extract of opium, night and morning, sometimes while fasting, at others during digestion. This was the daily equivalent of 40 grains of ordinary opium, so that at the close of eight days the bird had taken 320 grains of opium. During the following week I gave twenty grains of extract twice a day in bolus; more or less of this was vomited, but many doses were retained entire, and the pigeon had thus disposed in this one week of 280 grains of extract of opium. To sum up, in one fortnight, this bird ate much as usual; had its bowels relaxed somewhat, and vomited more or less, but showed no signs of coma, narcotism, or any muscular or sensory disability whatsoever. During this time it took in all 420 grains of aq. extr. opii—equal to 840 grains of opium."

I considered it useless to continue the experiment. Since this time I have occasionally given larger single doses, but nearly always they were partially gotten rid of by vomiting, either very soon after administration, or, as happened sometimes, twenty-four hours later, a fact which of itself proves how very slowly the poison is absorbed, and points thus to one of the elements which combine to protect the pigeon from fatal injury.

Expt.—July 20. I gave, by the mouth, 40 grains of aq. extr. opii at 3.23 P. M. July 21, at 2.20 P. M. while being handled it vomited about one drachm of brown fluid containing opium in large amount. During this twenty-four hours it was without food, but supplied with water. I should add that it also vomited 18 grains of like fluid an hour after it was first given. This was restored to the stomach, and no emesis occurred afterwards until the next day. It recovered without any symptoms of opium poisoning.

I next desired to learn whether the immunity, which seemed to be entire as regards ingested opium, was as complete when morphia was thus used. Accordingly—

Expt.—I gave a pigeon 7 grains of sulphate of morphia dissolved, by the mouth, at 5.20 P. M., July 13. For several days there was a slight but unusual tendency to crouch and keep still, but absolutely no other symptoms. The evacuations were healthy, or rather loose. Complete recovery.

Expt.—July 14. At 4.20 P. M. I gave, by the mouth, 12 grains of sulphate of morphia, dissolved in acidulated water. Held in the hand for half an hour; the pigeon trembled excessively and exhibited nausea. At 5 P. M., crouches; 5.40, pupils respond to light and dilate in the dark. July 15, 4 P. M. Found dead and rigid. Evacuations abundant.

Similar experiments were made with 1, 3, and 5 grains, but in no case did death occur. In another experiment 9 grains failed to kill, and a repetition in another pigeon using 14 grains caused death during the following night.

It thus became probable, first, that as regards poisoning with morphia internally, there is some individual difference among pigeons, irrespective of age; second, that the immunity is not absolute when morphia is ingested; and third, that as large a dose as 12 grains may be needed to insure death. It is possible that a smaller amount might, in rare cases, destroy life, but as the following observation proves even 12 grains may fail to secure this result.

Expt.—July 23, 3.05 P. M. My assistant, Mr. Landis, gave a pigeon, by the mouth, 8 grains of dissolved sulphate of morphia. At 3.30 it vomited a few drops, and at 4.30 took four additional grains. On the 26th it was well, lively, and particularly quarrelsome, and on the 30th was still in perfect health.

A second series of experiments were directed towards discovering what amount of morphia might kill when used hypodermically. As regards this point, I was surprised to find that wide differences were visible in different pigeons. This was partly due to various and easily seen causes, but in part also to reasons which probably rest on the idiosyncrasies of the birds employed.

Thus, pigeons of two or three months old were commonly killed by injections into the groin of half a grain to one grain, but sometimes, though rarely, survived two grains. The same amounts used under the skin of the back were much less fatal.

Older birds of the second year, as in Dr. Richardson's experiments and my former ones, were rarely killed by doses under two grains in the groin. I find recorded but one death from one grain, while the escapes from this fate are rare in pigeons which have received in the groin more than three grains. The present series of observations, therefore, show a singular range of susceptibility, and indicate very distinctly that, as regards hypodermic injections, the pigeon enjoys no such complete immunity as seems to obtain with opium given by the mouth, while as compared to morphia internally administered, the hypodermic method is vastly more fatal.

The phenomena of opium, or rather morphia poisoning in birds, are extremely interesting, from the absence of nearly all of the symptoms which are usually supposed to characterize this mode of death. My observations were made upon pigeons, chickens, and ducks, and lead to the belief that the latter two are nearly as difficult to poison as the pigeon. Unfortunately, I have been unable to secure any purely carnivorous bird with which to follow out one of Dr. Richardson's suggestions.

It is singular that birds should have been so rarely used as subjects on which to study poisons. Flourens has some almost forgotten cases of the poisoning of little birds by opium, with certain symptoms and pathological

appearances such as I have never met with in larger birds. I mention them at some length in a note,¹ not having been able to repeat them in the same species as he employed.

When a lethal dose of morphia is put in the groin of a pigeon, the bird seems unaffected for a few minutes or longer, and then tries to find a corner as far as possible from observation. Presently its gait becomes unsteady, and the tail is twitched up at intervals in an uncertain fan-like movement, or the wings stir in abrupt, short jerks. An increasing awkwardness follows, till at length the bird falls, and then, or while still erect, is seized with general convulsions, between which the breathing is seen to be very laboured. Meanwhile the darkened mucous surface of the mouth and larynx show how the blood is suffering, and at length it dies suddenly in violent convulsions. In no case have I seen sleep precede death, nor in any have I observed well-marked constipation. I have measured the pupils many times without noticing any such changes as opium causes in man. It may not be uninteresting to add that atropia, either in the eye, or given internally, has on the pigeon's iris no visible influence, except in some profound poisonings, to cause a curious swift alternate contraction and dilatation within a very small range of movement.

In birds, as in mammals, morphia lowers the temperature when it acts at all as a poison. The occurrence of convulsion not only checks this fall, but may suddenly elevate the column to the normal standard or even above it. No mode of exercise seemed competent to produce in the healthy pigeon a rise of more than one and a half degrees, but when opium had lowered the general temperature, then a convulsion was able to send the mercury up three to five degrees, so that, in some instances, there was the anomaly of the pigeon dying, with a temperature above that it possessed before being poisoned.

¹ My friend Dr. William Pepper assures me that he saw a large cockatoo survive unharmed an accidental dose of eight grains of aq. extr. opii.

M. Flourens' experiments are somewhat surprising. He used sparrows chiefly, and found that one grain of aq. extr. opii caused the bird to fall into a *stupor* at the close of fifteen to twenty minutes. At first light and easily interrupted, it became at last so profound that neither noise nor light availed to awaken him. Birds affected walked when pushed, flew when cast in the air, and on being let alone, took anew the attitude of deep sleep, the head turned beneath the wing. Larger doses produced convulsion and death, and the author found in a large number of cases, an effusion of blood between the two cranial tables, which, in small birds, can be seen to form during life. This symptom is also said to occur in pigeons, nor, according to Flourens, are these exempt from the phenomena observed in smaller birds. The text of this passage is somewhat dubious, but seems to be intended to describe as identical the signs of opium poisoning in pigeons and sparrows. I confess myself unable to reconcile the statements of this eminent physiologist with those made by Dr. Richardson and myself. Are pigeons different in France and in America?

The following selection from the records of a large number of experiments may suffice to illustrate the symptoms just described:—

Expt.—July 19. Pigeon, second year, rectal temp. $109\frac{1}{10}^{\circ}$ F., received in groin at 4.10 P. M., two grains of dissolved sulphate of morphia. Within one minute appeared unsteadiness of gait, the fan-like flirting motion of the tail, and soon positive rocking forward, with slightly laboured breathing. At the 20th minute, an effort to use the thermometer excited a great deal of struggle. The temperature was noted as $111\frac{1}{2}^{\circ}$. Fortieth minute, symptoms the same, temperature $109\frac{1}{2}^{\circ}$. The pigeon was now released and chased about, when the temperature was found to be $110\frac{1}{2}^{\circ}$. Sixtieth minute, remained seated, gasping somewhat; slight general tremor; neck muscles weakened and respiration more difficult; temperature $109\frac{1}{2}^{\circ}$. Convulsions at 64th minute, consisting in alternate motion of the two wings, and also of the two legs, with flexion of the toes. These spasms were brief, and not violent. During the intervals, a loud sound seemed to excite sudden and abrupt movements in the wings. Unable at this time to stand at all. At the 70th minute, temperature $109\frac{3}{4}^{\circ}$. The pigeon fell into a general convulsion of great violence, which passed into others of less severity at very short intervals. Death occurred at the 80th minute, the thermometer marking a rectal temperature of $113\frac{1}{2}^{\circ}$. Post-mortem rigor began in one minute in the legs.

Expt.—Pigeon; received in groin five grains of sulph. of morphia at 4 P. M. The symptoms were, in succession, uncertainty of movement, with jerking motions of wings, tail, and legs, increasing by laboured breathing; the darkened mouth of asphyxia; at length, unable to stand, convulsions, general in character, with flexion of the toes, and not tetanic in type. Meanwhile, continued fall of temperature, with a rise of over three degrees during the final and fatal convulsion.

If, now, this curious rise of temperature be due to the heat evolved during the excessive and morbid exercise of the muscles in spasm, it must be sufficient to overcome, and more than overcome the tendency to loss of temperature owing to poisoning by morphia. Other and very different causes connected with the vaso-motor nerves may be also at work; but, at all events, the subject would repay close study.

Thus far my observations exhibit a very striking uniformity of symptom among the pigeons studied. Always there were unsteadiness, laboured breathing, increasing signs of apnœa, unaltered pupils, and finally general convulsion and death. In no instance was there any true hypnotic effect.

The influence of opium and of morphia salts upon the domestic chicken and duck were also studied; first, with a view to learning whether these, like pigeons, were difficult to poison; and secondly, what were the symptoms caused by lethal doses.

Expt.—Sept. 15. A large cock chicken received in the thigh 1 grain of dissolved sulphate of morphia. No effects were visible.

On Sept. 17, five grains similarly employed produced no notable symptoms.

Sept. 20. A cock chicken received, subcutaneously, in the groin, ten grains of sulph. morph. at 2 P. M. At 3.30, is inclined to stand still; mouth remains open, respiration quick and laboured. Eyes shut; rocks on his feet, and inclines to fall backward. Finally crouches, and at times makes ineffectual efforts to stand, being occasionally successful, and again sinking suddenly on his breast. He is now, 5 P. M., extremely feeble, the eyes being shut, and the head swaying to and fro; frequent watery stools. At 5.30 same condition. The next day he was well and fed eagerly.

Sept. 22. I injected into the breast and two thighs of this same bird twenty grains sulph. morph. Injection occupied five minutes. Released at 2.15 P. M. He ran to a dirt-pile, and scratched in pursuit of food. At the 8th minute signs of distress appeared; eyes shut, mouth gaping, unsteadiness on feet. 2.45. Crouches. 3.20. Unable to stand when pushed or teased; occasional convulsive starts. 3.40. Restless, frequent starts; watery stools; eyes unaltered; breath laboured. At 4.7, sudden and violent convulsion, with legs rigidly extended. The fit lasted a few seconds, and was followed by quietude, now and then broken by spasmodic extensions of the legs, the bird lying on his side and uttering a curious note like a faint bark. 4.9. Convulsion as before. 4.12. Lies on side; frequent spasms of legs in extension, the head remaining at rest, and the wings merely twitching; respiration gasping in character, and death at 4.14, without other symptoms.

Expt.—A hen took, by the mouth, thirty grains of extract of opium without visible after-effect.

Expt.—In this case, the exceptional excitement of brain by opiates was noticed, and a range of symptoms somewhat unlike those which we commonly see in the chicken. A hen received in thigh ten grains of sulph. morph. at 4.23 P. M. At 4.25 became unsteady; mouth open, respiration irregular and laborious. 4.29. Crouches. At 4.55, somewhat better. Took, by mouth, 100 drops acet. opii. At 5.10, after having been tranquil and sleepy, eyes shut, and standing up, had a period of what looked like delirium with vertigo. He ran to and fro, and at last rotated to the left for half a minute. Presently this passed off, and at 5.30, had a second turning fit. After this he was sensitive to light and sound, and at one time as if half asleep, and presently again excited, and furiously attacking a duck. After this the rotations were frequent. They began with a cry and a ruffling up of the neck feathers. At 5.36, violent turning, after which he crouched; but at 5.40 he was evidently weak, and the turnings became converted into swift shuffling to the left. Then he fell on the left side and had twitchings of feet and wings, synchronous with the laboured breath, the head jerking incessantly. At last he had a single general convulsion, ending in death at 6 P. M. Rigor in the legs set in within one minute.

Expt.—A large duck showed no evidence of poison from six grains of morphia at one time, and nine at another a week later. Ten grains thrown into the groin caused emesis in one minute. After 40 minutes he was so little influenced, that I gave in like manner twenty grains. In two minutes he crouched, unable to stand, and showed great distress in breathing. In a few minutes he rallied, and, when walking, would fall suddenly, his legs slipping out apart from one another. Then he began to twitch all over, uttering an incessant quack, and at the 68th minute fell in violent tetanoid convulsion, the feet extended, the head thrust out. The fit ended in sudden death.

I have also examined the effects on birds of some of the rarer alkaloids of opium. In order to enable observers to compare my observations with those made upon mammals, I have exacted from each specimen of the alkaloid used a rigorous identity, in chemical reaction with that employed by Dr. Harley. I found the need for precaution in one specimen of Thebaïa (Paramorphia), which gave altogether different results from a second supply. (For the latter, and for the most courteous interest in my investigation, I have to thank Messrs. Powers & Weightman). Of cryptopia, the latest discovered of these bodies, I have been able to get but a small specimen, amounting to one grain—a fact which I greatly regret since reading Dr. Harley's very interesting account of its physiological effects.

Narcotina seems to have been omitted by Dr. Harley in his examination of the opium alkaloids, for what cause does not appear. By many authors

it is classed as inert. Orfila found that thirty grains were required to kill a dog, but it has been given by Dr. Garrod to man in doses of thirty grains, and was reported by him and O'Shaughnessy to be merely tonic and anti-periodic. Doses of 120 grains are said to have been given to man without effect.¹ I have taken narcotina several times, in doses of 5, 10 and at last 30 grains with no result save some slight gastric embarrassment which may possibly have been due to other causes. The specimens used by me were two in number. The first, indicated as No. 1 narcotina, was made by Powers and Weightman. The second, similarly distinguished as No. 2 narcotina, was manufactured many years ago by Robiquet, Boyveau & Pelletier. Both gave the usual chemical reactions.

Expts.—Narcotina was given to pigeons by the mouth in powder or dissolved in acids, in doses of two to six grains, but without obvious effect.

Expt.—To a large pigeon, five grains of narcotina No. 2, dissolved, were given subcutaneously at 4.26. Temp. of rectum 108°. Within four minutes some twitching of the tendons of the feet was visible, giving rise to slight unsteadiness of gait. At the 5th m. nausea and vomiting; 7th m. moves about in an excited way, then suddenly has retraction of head, difficulty of breathing, and successive general convulsions. The effect on temperature was in this case remarkable, because, despite continued convulsions rarely interrupted during half an hour, the mercury fell to 96° F. five minutes before death, which took place at the 84th minute.

Post-mortem examination.—The right heart was still acting, and all the muscles appeared to be irritable. In another case, three grains, by the groin, and five of No. 1 narcotina by the crop, caused death within twelve hours.

Expt.—One and a half grains of No. 2 narcotina dissolved in water and sulphuric acid, and put under the skin in three places, caused, in thirty seconds, excitement, feebleness, convulsions of tetanoid nature, irregular respiration, and death in ten minutes.

In many instances pigeons escaped death after hypodermic doses of two grains, but very generally such amounts produced feebleness, unsteady gait, and early convulsions, depending less than in morphia upon the previous induction of apnœa. None of the birds were affected with stupor, and in all the tendency to convulsion was the predominant symptom.

The facts I have here recorded are among the most curious which have fallen under my notice in the course of this inquiry. That a drug which is apparently incapable of killing man should be so fatal a convulsivant to the bird appears to me most remarkable, and as contrasted with the opposite case of opium, a poison for man, and with difficulty hurtful to the pigeon in any mode of administration, the toxic energy of narcotina must certainly be regarded as among the most singular facts in toxicology.

Thebaita.—This alkaloid, some times known as Paramorphia, corresponded absolutely as to chemical reactions with that used by Dr. Harley. It was made by Powers & Weightman, of Philadelphia. The tetanizing action of this agent has long been known; a dog, according to Harley, has been killed by two grains used hypodermically, and mice perished from

¹ Gmelin, Handbook of Chem., vol. xvi. p. 137.

the use of $\frac{1}{12}$ to $\frac{1}{20}$ of a grain. It proved speedily fatal to pigeons, causing terrible tetanic spasms as related in the two following experiments:—

Expt.—A pigeon received in the groin one grain of paramorphia partially dissolved. At the close of a minute the pigeon was seemingly unaffected. But suddenly fell into the most terrible tetanic spasm, the feet thrown out, the head turned back and twisted to the left. The wings merely quivered a little, the legs being most affected. So intensely violent were the spasms which succeeded, that while they endured, respiration was altogether impossible. Death occurred in two minutes.

Expt.—A pigeon received in the groin one-third of a grain of paramorphia dissolved in thirty mm. of acidulated water. Vomiting occurred within a few seconds followed by sudden and violent tetanic convulsions, with scarcely an interval of repose until death took place at the close of one minute and thirty seconds. In these spasms the limbs were extended rigidly, the spine bent, the tail turned up, the head thrown back and twisted almost completely around so that the beak pointed towards the tail.

Comparing these with cases of strychnia poisoning, I have been unable to detect any essential difference. The tetanic spasm, a tendency to which is exhibited by birds to which narcotina has been given, finds here in poisoning by thebaia a perfectly typical presentation, while, as we have seen, a likeness to the strychnic spasm may be sometimes observed in the deaths of birds poisoned by morphia.

Meconine.—This alkaloid, prepared by Rosengarten & Sons, responded to all the usual chemical tests. Dr. Harley states that he is unaware of any observations upon its toxic action, and quotes Orfila to the effect that three grains thrown into the jugular vein of a dog produced no ill results.

Dr. Harley ascribes to it slight tranquillizing and hypnotic effects when placed under the skin in doses of one to two grains, but saw no such influence from the ingestion of five grains. I myself have taken first two and on another occasion six grains suspended in cold water without effects of any perceptible character, and since birds are not put to sleep by the other opium derivatives, I was prepared to find no result from meconine, which is only slightly soluble in water at the normal temperature of the pigeon.

Expt.—Eleven grains of meconine were made into pills with soap and given to a pigeon at 4.10 P. M. Vomiting took place in a few minutes and repeatedly afterwards for two hours. No other symptoms were noted.

June 17. Six grains, partially dissolved and in part suspended, caused vomiting when ingested, but gave no other evidence of activity.

June 16. Twelve grains administered in the same way produced no other result.

I suspected that the irritation of stomach might be due to the presence of the needle-like crystals of this alkaloid, for which chloroform alone is a perfect solvent. At all events its difficult solubility must render it very slow of absorption; and, in this as in other like cases, may interfere to prevent the exhibition of symptoms which might be observable if we possessed a solvent vehicle capable of readily conveying it into the blood.

Expt.—In three instances I placed under the skin in a state of partial solution in hot water, 3, 8, and 12 grains of meconine. The injections were made with a hypodermic syringe, armed with a tube large enough not to be clogged

by the fine crystals. The alkaloid was fully dissolved in boiling water, which was allowed to cool to 100° F.—the fluid being constantly stirred so as to insure the precipitating crystals being as small as possible. At first I thought that the agent thus used tranquillized my pigeons, but further observations showed this tendency to repose to be due rather to the desire of a pigeon so wounded to remain at rest than to any toxic power of the salt employed.

No convulsive symptoms occurred in any case, and as I have said no conclusive signs of stupor appeared.

It thus appears that meconine is only emetic when given to birds by the mouth, that it has no perceptible power to hypnotize or to excite the brain or spine when used under the skin, and that six grains of it taken internally by man have no appreciable influence.

Codeia, considered by Magendie to be a hypnotic and stupefier, and to be for these purposes half as strong as morphia, has also been examined of late by Harley. This latter observer¹ (p. 169) seems to have some doubt as to the codeia used by M. Bernard, and refers to a statement made by himself, p. 141 of his treatise, for the reasons justifying this doubt. On referring to the page in question I do not find, however, any such explanation, except as regards narceine.² At all events, my own codeia, made by Rosengarten & Sons, answers to all the requirements of Dr. Harley's identifying tests. Bernard considers it as a hypnotic when given to dogs in doses of $\frac{1}{77}$ gramme; but Harley finds that in doses of two or three grains hypodermically employed it causes only depression of the respiratory system and of the cardiac function, and a latent tendency to convulsion. In the mouse it produced like results, ending in tetanic convulsions and death. In four to five grains it causes in man some disposition to sleep, but never occasions in these amounts any decided effects of this character. Like morphia, it at first raises the pulse, contracts the pupil, and very often gives rise to gastro-intestinal derangement. I have myself taken five grains in one dose after failing to secure marked results from two grains. The former dose was taken fasting. In an hour the pulse had risen 20 beats per minute, and I felt slight giddiness, nausea, and a sense of heaviness about the head without any remarkable desire to sleep. These symptoms slowly passed away, leaving me with a sense of gastric oppression for two or three days.

¹ The Old Vegetable Neurotics, by John Harley, M. D. London, 1869.

² I quote from a letter of Dr. Harley to me, dated Nov. 1, 1869, the following remarks, which serve to clear up the matter spoken of in the text: "First as to Bernard and codeia. My reasons for referring to p. 141 to show that the codeia used by him was doubtful, was as follows: Bernard there says that narceine is more valuable than codeia. At p. 142 of my work, I show that what we English call pure narceine is one of the most insoluble constituents, not only of opium, but of the whole vegetable kingdom. Where shall we find another substance that is neither soluble in water (for water which only dissolved $\frac{1}{400}$ th part can hardly be called a solvent) nor in alcohol, nor ether, nor chloroform? Turning to codeia (p. 160) we find it soluble in 25 parts of water and in 40 of ether, while it is miscible in almost any proportion with alcohol and with chloroform. If Bernard could say that narceine was more soluble than codeia, what was I to think of his codeia on the one hand, and of his narceine on the other? for as soluble bodies they seem to me the exact antipodes of each other."

These observations scarcely prepared me for the powerful influence which codeia exerts on pigeons.

Expt.—I placed under the skin in three localities seven grains of codeia dissolved in water, with the aid of nitric acid. Before I could set the bird at liberty violent convulsions came on, ending in death within one minute. These spasms were not tetanic.

Expt.—One grain dissolved was used under the skin of the groin. When released the pigeon moved about in what seemed to be a delirious restlessness, but which in a few moments was clearly made out to be the state of muscular irritability which precedes convulsions. The bird shifted about uneasily, flapping his wings and stamping his feet in incessant motion. This was followed, or rather this increasing passed into general convulsions, with flapping of the wings, jerking of the head, and alternate flexure and expansion of the feet and toes, until death took place in three minutes.

Expt.—Half a grain of codeia produced like results, and death in eight minutes.

These, with other observations, enable us to draw a distinct line as to convulsing energy between this drug and morphia, since doses of the latter agent not exceeding a grain, often allow of escape from death, and even larger quantities only effect destruction to life after a far greater lapse of time.

Narceine.—In regard to this substance, there seems to have been a certain confusion which must have arisen from the employment by various observers of substances which under one name possessed different qualities, both physical and physiological. Claude Bernard looks upon narceine as superior even to morphia in its somniferous power. He states also, that it is free from any convulsivant or excitant action, and that animals killed by it die in a state of muscular relaxation, such as I have never found to occur with pigeons under any of these agents.

The French and German observers generally regard it as a gentle hypnotic. Dr. Harley is distinctly of opinion that the drug used by Bernard was not pure narceine because of its far greater solubility in water than the alkaloid described by Pelletier and recognized as narceine in England. Dr. Da Costa appears to have had similar doubts, and Mr. T. Smith, of Edinburgh, informs Dr. Harley that meconine which separates with narceine may give it the appearance of increased solubility.

I have taken it myself (Merck's narceine) in doses of one-half a grain up to five grains. The latter dose alone produced any effect. It was taken dissolved in warm glycerine—two drachms with one drop of sulphuric acid. An hour after taking it I felt a slight headache and sense of constriction, but observed no change in the pulse or the respirations. I was doubtful as to whether or not it caused any hypnotic effect, and conclude, therefore, that it can hardly be very powerful. I had no dysuria. How to explain the discrepancy between such facts as this and others of like nature observed in my own practice or that of Dr. Da Costa, I do not see, unless by supposing, with Dr. Harley, that the alkaloid as furnished varies remarka-

bly. In his hands this agent was found to be a gentle hypnotic, but owing to its insolubility unfitted for hypodermic use.

The great therapeutic importance recently assigned to narceine by Bernard, and supported by the clinical observations of Bèhier and others, induced me to examine the alkaloid with unusual care. I have studied specimens from three distinct manufacturers, and regret having been unable to add one of French origin. I give in tabular shape the appearance, colour-reactions, and relative solubility of each make of narceine.

Physical Characters.

No. 1.	No. 2.	No. 3.
E. MERCK.	POWERS & WEIGHTMAN.	FOREIGN, OF UNKNOWN MAKE.
"Compressed asbestos-like mass of soft acicular crystals, very light and colourless."—HARLEY.	Like No. 1, but slightly tinted with pink, probably an accidental impurity, more loose in texture and more bulky than No. 1.	Like No. 1.

Solubilities.—No. 1. Merck's is soluble in 1000 parts of distilled water at 60° F. No. 2. Powers & Weightman's dissolves in 4000 parts of water at 60° F. No. 3. Foreign, maker unknown, imported by Bullock & Crenshaw, soluble in 2100 parts of water at 60° F.

No. 1. Merck's narceine is wholly soluble in 95 parts of water at 212° F., and begins to precipitate at 175° F. At 140° F. a large part has separated from the solvent.

No. 2. Powers & Weightman's is dissolved by 300 parts of water at 211° F., and begins to precipitate at 160° F. At 90° F. not one-half has separated.

No. 3. Procured from Bullock & Crenshaw; maker unknown; is dissolved by 175 parts of water, at 212° F., and begins to precipitate at 190° F.

Dr. Harley's narceine, made by the Smiths (Edinburgh), or by Morson, was more soluble than any of my specimens. One part was soluble in 100 of water at 212° F., and in 400 parts of water at 60° F. Bernard's narceine was made by Merck, of Darmstadt; by Menier, of Paris; and with unusual care by Guillemette, of the same city. This correspondence in the make of the substance between his narceine (Merck's) and mine still further complicates this puzzling question.

I give next the colour tests which are less reliable for identification. It is to be regretted that Bernard does not supply either these or the solution tests.

Colour Tests.—Hydrochloric acid, sp. gr. 116, diluted five times with water gives with

No. 1.	No. 2.	No. 3.
A fine blue.	A fine blue.	Dissolves without colour.

All the specimens dissolve in the pure acid without colour.

Nitric acid gives

No. 1.	No. 2.	No. 3.
Orange yellow,	Orange yellow,	Orange yellow,

with aqueous solutions. A morsel of narceine let fall on a drop of the pure acid gives a yellow centre and orange edges.

SO₃ dissolves all three of the specimens with a deepening amber hue, which becomes greenish orange in Dr. Harley's narceine, as in all of mine, and finally

takes a port-wine red. On heating, it then becomes chocolate-brown with a purplish tint. On adding 100 parts of water, fine brown flocculi are seen, and an excess of potassa at length throws down, in his case "a quantity," in mine a moderate amount of dark brown flocculi, the proportion varying in the three specimens, but in all leaving above a colourless fluid.

The great discrepancy as to solubility, and in one case as to one of the colour tests, makes it difficult to conceive of the various specimens as being identical in chemical construction. I have tested all three on myself, in doses varying from two to five grains, without any notable result.

The three following observations represent the influence of this drug upon the pigeon.

Experiment.—Two grains of narceine, Merck's, were dissolved in 30 mm. of hot glycerine with one drop and a half of chlorohydric acid. The solution was clear on cooling. It was injected into the two groins in three localities. There may have been some slight difficulty of breathing within a few hours, but no other result.

In two others I used four grains hypodermically, employing the other specimens of narceine, that is Nos. 2 and 3, but was unable to observe any marked result.

Since the date of these observations I have repeatedly injected five to six, and once nine grains of narceine, dissolved in acidulated glycerine, but, except the often noted tendency to rest quiet in a corner, no symptoms of moment were seen.

In the confusion which at present obtains in regard to the various manufactures of narceine, I am unwilling to draw any very absolute conclusions, but it certainly appears that the agents employed by Harley and myself must be different from that used by Bernard. Perhaps it were safe at least to assert that some of my specimens must represent a large percentage of narcine, or may indeed be pure, so that in any case we may confidently conclude that narceine is among the lowest of the opium alkaloids in its power to produce convulsions, the pigeon being taken as the agent most susceptible to this form of toxic impression.

Cryptopia, the last discovered of these numerous and interesting bodies, has been examined physiologically, or rather clinically, for the study was not a full one, by Dr. Harley, who considers it to be a cerebral excitant, and to a less degree an hypnotic. In large doses it dilates the pupil, and as a somniferous agent is regarded by Dr. Harley as being twice as active as meconine or narceine, and one-fourth as powerful as morphia.

I have been able to secure but one grain of cryptopia, but as this was of the make of T. & H. Smith, the discoverers, I considered it to be identical with Harley's. The small amount of the drug in my possession necessarily limited my experiments.

Expt.—One-fifth of a grain of cryptopia used under the skin of a pigeon caused nausea and efforts at emesis in five minutes. At 15th minute the bird appeared to be weak, and the breath was long and laboured. It was seemingly well next day, but was found dead on the morning of the third day. I had of course a good deal of doubt as to this result being due to the cryptopia, and

these doubts were strengthened by the absence of any more marked results in a second pigeon, which received subcutaneously half a grain, and did not die.

Since reading the first proof of this paper, I have to thank Dr. Harley for a larger amount of cryptopia, and to express my regret that it came too late to admit of my adding any new experiments.

Porphyroxin and *papaverine*, which complete the list of alkaloids of opium, I have been unable to procure. These various agents possess, as has long been known, very diverse effects. Taking morphia as an example, in some persons it causes only cerebral excitation with delirium and insomnia. In others it affects chiefly the spinal centres, occasioning nausea and emesis of obstinate character, while in very rare instances, one of which was illustrated recently in the person of a physician of this city, it produces tetanoid symptoms. More commonly it brings on sleep, but these influences may coexist in various degrees in the same person, or one or two only may be perceptible.

Dr. Harley has pointed out the fact, that in different animals one or other of these effects largely predominates, and has thus illustrated anew the necessity of studying every poison on numerous classes of animals, a precaution upon which I have more than once insisted. My present research still further emphasizes the need for an enlarged method of study.

In all of the animals examined by Dr. Harley, sleep was produced, though with an amount of difficulty, and from quantities of morphia largely varying in the several cases, while in the mouse and the horse, the action of this drug on the spinal centres was probably more notable than in man. A comparison of these results with those which I have obtained in birds, is alike interesting and instructive. We have in the latter a class of beings which, for reasons presently to be stated, are practically incapable of being poisoned by the ingestion of opium, and which are affected only by enormous doses of morphia. Where the latter has been given in sufficient amount, we have, up to the moment of convulsion, absolutely no induction of sleep or stupor, neither do we observe any loss of sensation, general or special, but the heart is quickened, and respiration made laborious, by the influence of the poison upon the respiratory centres. The convulsions which precede death seem to be sometimes due to asphyxia, and are then incessant up to the moment of death, while in others they seem to be due merely to a general excitation of the motor ganglia, since they occur at intervals, with periods of comparative freedom intervening.

Neither can I agree with Baxt or Bernard in regarding the convulsions caused by morphia as being always tetanic in character—a point, however, on which I shall have further occasion to dilate. In birds, then, morphia acts with difficulty, causes no sleep and no delirium, and strikes chiefly the motor and spinal centres, affecting very early the respiratory ganglia, and to a certain extent depressing the temperature. There is one reason for

this marked influence on breathing, which is explicable by certain peculiarities of the respiratory organs. In man and mammals generally, the motor nerves of respiration leave the spine high up in the cervical region, and the essential fibres run a short course to their respective muscles. In birds, however, the respiratory organs extend into the lower belly, and the movements of this part, as well as of the regions above it, seem necessary to sustain life. The nerves of respiration emerge at various points all the way down to the lower dorsal vertebræ, and a cross section of the spine anywhere above this point causes sudden death. The large number and great length of these nerves have probably something to do with the readiness with which the breathing becomes embarrassed, with the prominence, in a word, of this symptom.

M. Bernard has divided the effects of the various opium alkaloids into three classes, soporific, convulsive, and toxic; one or other of the three being predominant in the case of each of these agents, but not of necessity to the exclusion of the other two. M. Baxt in like manner arranges them under the two heads of convulsives and narcotics, while Harley is disposed to consider that all of them are alike excitant, and hypnotic in varying degrees. Each of these observers may be absolutely right as regards the physiological reactions of the alkaloids in question, considered with reference to certain animals, but the attempt to apply their conclusions broadly so as to include birds, only serves to show the great necessity for caution in all such deductions.

Let us compare the results obtained by Bernard and Baxt with my own, premising that as yet, with the exception of morphia, these alkaloids have never been as thoroughly studied as belladonna or woorara, and that neither Bernard's classification, nor Baxt's, nor mine, is more than a mere toxicological sketch.

M. Bernard believes, as I have said, that the opium alkaloids have three properties or powers: 1. Soporific; 2. Excitant or convulsing; and 3. Toxic. He classes them thus in the order of their power.

Excitant or convulsive agents.—1. Thebaine. 2. Papaverine. 3. Narcotine. 4. Codeine. 5. Morphine. 6. Narceine.

Soporifics.—1. Narceine. 2. Morphine. 3. Codeine. The three others have no soporific force.

In capacity as poisons, viz., toxics.—1. Thebaine. 2. Codeine. 3. Papaverine. 4. Narceine. 5. Morphine. 6. Narcotine.

What strikes us most about this arrangement is the want of relation between toxic power and capacity to convulse, as instanced in the position of narcotine, and the high place as a soporific assigned to narceine.

Waldemar Baxt, quoted in *American Journal of Medical Science*, October, 1869, regards the opium alkaloids as either narcotic or tetanically convulsive. In narcotic energy, he arranges them thus: 1. Papaverine; 2. Morphia; 3. Narceia; 4. Codeia; etc. As convulsives thebaine

stands first, porphyroxin second, narcotine third, codeia fourth. Dr. Harley's view of the matter from this standpoint varies from that of Bernard or Baxt, and there are so many discrepancies among the three observers as to indicate the need for a still further examination of the subject. For reasons already pointed out, I have limited my own experiments to birds, and despite the statement of Bernard as to the power of morphia, codeia, and narceia, to produce in pigeons and sparrows the forms of sleep which he regards as peculiar to these drugs, I have been unable to detect anything in this direction, beyond a slight tendency to quietude, which we can never be sure is not due to the habit of the wounded or sick pigeon of seeking a remote corner and remaining at rest.

As regards power to stupefy, I can therefore make no classification. My experience with cryptopia has been too limited to allow of any positive conclusion. All but two of the other alkaloids examined by me cause convulsions, but thebaia alone appears to be truly a tetanizing poison, although in the duck, and rarely in the pigeon, morphia caused spasms, which may be termed tetanoid. Thebaia stands highest in rank as a convulsant, and is followed in order of power by narcotina, codeia, and morphia, meconine and narceine having no such influence. In this arrangement of narcotina I agree with Bernard and Baxt. Neither of them makes mention of meconine, which Harley regards as distinctly hypnotic, but which is almost without influence in the pigeon, even when given in enormous doses.

My own arrangement of the relative poisoning power of the substances we are considering would be as follows :—

1. Thebaia ; 2. Codeia ; 3. Narcotina ; 4. Morphia—Meconin and Narceina being too innocent for addition to the list. It will of course be remembered that this statement applies only to birds, and chiefly, indeed, to pigeons.

The conclusions which I have finally reached in regard to the influence of opium alkaloids on birds are as follows :—

1. Birds : namely, ducks, chickens, and pigeons, are never poisoned by crude opium, its aqueous extract, or acetum opii (black drop), given internally ; while the salts of morphia must be given in enormous doses to produce fatal effects when administered in the same manner.

2. Morphia salts, used hypodermically in excessive amounts, never cause sleep or stupor, but act as excitants (convulsants) upon the motor centres. In some instances, the spasms are tetanoid in character ; but in the duck they approach nearest to the typical strychnic spasm.

3. Thebaia is a tetanizing agent, only inferior in energy to strychnia and brucia.

Narcotina, almost inert in man, destroys birds when employed hypodermically, in doses of from 2 to 7 grains.

Codeia is a fatal convulsing agent in birds (pigeons).

Meconin causes emesis when given internally, and is harmless if placed under the skin.

Narceia has no perceptible influence, except to disturb slightly the respiratory function.

Cryptopia in doses of $\frac{1}{8}$ to $\frac{1}{2}$ gr. has no effect.

None of these agents cause sleep in the pigeon, duck, or chicken.

The inaction of ingested opium is due, as I believe, to two causes.

First, to the very great slowness with which it, as well as morphia, is absorbed. This is shown by the fact that, twenty-four hours after a full dose has been given, the pigeon may vomit it in large quantities. In a few cases, the greater bulk of what I had given was thus rejected; but in many others all was retained.

The remaining amount of protection necessary to constitute an insurance against fatal results, must be due to the great difficulty with which pigeons, especially old birds, are poisoned by opiates. Probably elimination is sufficiently rapid to protect the system against a dangerous accumulation of the drug; but since the feces and urine are evacuated from a common cloac, I have been unable to study the rate of excretion in a satisfactory manner.

Pigeons, and probably other birds, seem to possess the same peculiarity which causes certain men to exhibit, under opiates, only excitement of the motor ganglia, emesis, and a restlessness, which, with fuller doses, might possibly eventuate in convulsions—a rare incident of opium poisoning, which, however, occurred early in a case that I have elsewhere reported. The normal sleep of these birds is not nearly so profound as that of man; and, on the other hand, their motor nerve system enjoys the faculty of evolving an enormous amount of force, and, as compared to their cerebral manifestations, is far more prominent. It is possible that we may discover that equivalent doses may affect more profoundly, in the direction of stupor, the creature taking them in proportion as its cerebral development is greater and its brain more active. Such, at least, seems to be the probable conclusion from a general survey of the effects of morphia on various classes of animals; while, especially in mammals, it will, I think, be discovered that individual peculiarities come in to modify the result, as they never so distinctly or so frequently do in the lower grades of animal life.

I had suspected that the enormous respiratory apparatus of birds might have some share in protecting them from opiate poisons; and this may possibly be the case, but I may add that I have failed to make it sure by the aid of experiment. An elaborate series of nearly an hundred experiments were made, to discover whether oxygen gas would increase this protection, and whether a small percentage of carbonic acid in the air breathed would plainly destroy it, and cause to be fatal doses which are not otherwise lethal. The great labour thus expended failed to afford any other

than a negative result, and only left it clear to me that the inhalation of oxygen does not protect the system which has been attacked by morphia.

I have once again to repeat my thanks to my assistant, Mr. Landis, for the industry and accurate care with which he aided me in the conduct of this research.

ART. II.—*Amputation at the Knee-joint by Modified Lateral Flaps.*

By STEPHEN SMITH, M. D., Surgeon to Bellevue Hospital, New York.
(With three wood-cuts.)

AMPUTATION at the knee-joint may now be regarded as an established operation in surgery. The dangers which have hitherto surrounded it have all been dissipated by the well-directed labours of Markoe, of New York, and of Brinton, of Philadelphia. The recent elaborate papers of these surgeons prove that in every essential particular in which amputation at any point of the leg is justifiable, it is equally justifiable at the knee-joint. The advantages of any given amputation are determined by its safety to life, and the serviceableness of the stump. The statistics embodied in the papers referred to establish the fact that amputations at the knee-joint are as safe as amputations through the thigh. They also prove what is more important, viz., that amputations at the knee are less fatal than similar operations in the upper third of the leg.

There remains still the important question, What method of operation is preferable? Various and very diverse opinions are entertained by surgeons on this subject. The methods recommended and now practised are the long anterior and short posterior flaps, the lateral flaps, the circular, the long posterior flap with section of the condyles (*Syme*), and the long anterior flap with section of the condyles (*Carden*).

The opinions expressed by Markoe and Brinton, the latest writers on the subject of amputation at the knee-joint, and surgeons of large experience, are deserving of especial attention. Markoe says (*N. Y. Med. Journ.*, March, 1868, p. 515):—

“The mode of operative procedure is so frequently determined by the condition of the parts after the injury that, I doubt not, most surgeons will arrive at the same conclusions that have gradually forced themselves upon us, viz., that it is really of comparatively little consequence what particular method of cutting the flaps be adopted, provided only that enough integument be left amply and easily to cover the expanded extremity of the femur.”

He has been inclined to give preference to a long anterior and short posterior flap, because a thicker and tougher covering is thereby secured to the condyles, the drainage is such as to prevent collections of pus, the

ligatures are brought out more directly, and the cicatrix is placed behind the swell of the condyles.

Brinton expresses nearly the same opinion and preference. He says (*Am. Journ. Med. Sci.*, April, 1868, p. 336):—

“The main indication in the disarticulation of the knee is to obtain a sufficient amount of integumental covering to admit of the lips of the wound being brought together without strain. Whether this be accomplished by the circular or oval method, or by the formation of lateral or of antero-posterior flaps, matters but little. The writer’s experience inclines him to give the preference to the latter procedure.”

Something more, we believe, is now required in this as well as in all other amputations of the lower extremity than the easy adjustment of the flaps at the time of the operation. In the first place, we cannot overlook the proper drainage of the stump during the process of healing. This can be effectually secured, and quite as effectually prevented, by the method of making the flaps. In the second place, it must be remembered that this stump is to receive direct pressure, in progression, from the artificial limb, and hence the necessity of carefully securing such flaps and their adjustment as will render the face of the stump firm and resisting. No stump can be regarded as well adapted to take direct support which is traversed by a cicatrix, and the position of the cicatrix will be determined by the method of operation adopted.

The method of amputation at the knee-joint has, therefore, a much more important bearing upon the immediate success of the operation, and the future usefulness of the limb, than the mere approximation of the flaps without strain. The question recurs, then, What method of forming a covering to the knee-stump will most effectually meet the two conditions above given, viz., thorough drainage, and such cicatrization as relieves the stump from pressure upon a cicatrix?

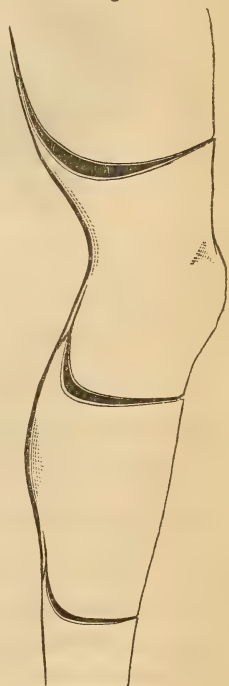
It may be affirmed of the antero-posterior flaps, as usually made, that they more effectually prevent drainage, and more certainly bring the cicatrix upon important parts of the face of the stump, than any other method of amputation adopted at the knee. When, however, the anterior flap is sufficiently long to allow the posterior flap to be nearly circular, the drainage is direct, and the cicatrix is posterior to the face of the stump. The danger is incurred of sloughing of the anterior flap, which must be made of great length, to cover the extremities of the condyles of the femur. The method by lateral flaps is even better adapted to drainage than that of the long anterior flap, and has the additional advantage of two moderately-sized and well-nourished flaps. But it fails to place the cicatrix beyond the seat of direct pressure on the anterior part of the stump. The circular and oval methods are less adapted to meet the conditions above given than those just described.

The methods of Syme and Carden, involving excision of the condyles,

are extremely objectionable, as well as entirely unnecessary, unless there is too little flap.

It is evident from this statement of the results of the different methods of operation that the long anterior flap and the lateral flaps combine the advantages which we seek, both in drainage and the position of the cicatrix, and yet each has certain disadvantages. In several recent amputations at the knee-joint I have endeavoured to combine the good features of the long anterior flap and the lateral flaps, without their objectionable points. The operation is performed as follows: The incision is commenced about one inch below the tubercle of the tibia, and carried downward and forward over the most prominent part of the side of the leg, until it reaches the under surface, when it is curved towards the median line. When that point is reached, it is continued directly upwards to the centre of the articulation. A second incision begins at the same point as the first, and pursues a similar direction upon the opposite side of the leg, and meets it in the median line on the posterior part. The line of incision upon one side is seen in Fig. 1. The following precautions should be remembered, viz., the incisions should incline moderately forwards down to the curve of the side of the leg, to secure ample covering for the condyles, and that upon the internal aspect should have additional fulness for the purpose of insuring sufficient flap for the internal condyle of the femur, which is longer and larger than the external. In the dissection, the skin, fascia, and cellular tissue are raised, and the ligamentum patellæ divided, allowing the patella to remain. The ligatures are all drawn out of the posterior angle of the flaps.

Fig. 1.



The appearance of the flaps immediately after disarticulation is seen in Fig. 2. It will be noticed that the extremity of the femur is already completely covered, and the line of union of the flaps will be between the condyles and over the inter-condyloid notch. When cicatrization is complete, the cicatrix sinks into this notch and disappears from the face of the stump, and offers no point of contact with the artificial appliance. The appearance of the stump on recovery is given in Fig. 3.

In the process of repair, it will be found that the drainage is so perfect that all the anterior portion of the wound remains dry, and frequently heals by immediate union. The dressing of this part of the wound often

need not be disturbed more than once or twice until cicatrization is complete.

Fig. 2.

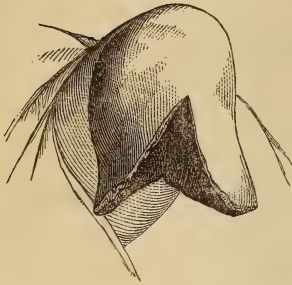


Fig. 3.



This method of amputation need not be limited to the knee. The advantages of drainage, and the removal of the cicatrix from the face of the stump to its posterior part, equally adapt it to amputation in the leg or thigh. I have frequently amputated at both of these points by this method, and obtained the most satisfactory results. The wound heals with remarkable rapidity, and the final perfection of the stump leaves all that can be desired. In Fig. 1 the line of incisions is given in amputation of the leg and thigh by this method. The incision on the posterior part of the leg should extend upwards to the point where the bone is to be sawn through, and there the muscles are divided circularly.

NEW YORK, Oct. 1869.

ART. III.—*A Contribution to the Knowledge of the Physiological Action of the Alkaloids, Viridia, Veratroidia, and Veratria of Commerce, and of the Resin of Veratrum Viride.* By HORATIO C. WOOD, Jr., M. D., Professor of Botany in the University of Pennsylvania. (Read before the Biological and Microscopical Section of the Academy of Natural Sciences, Nov. 1869, and recommended for publication.)

MR. CHARLES BULLOCK, of this city, in the *Proceedings of the American Pharmaceutical Association* for 1867, announced that he had finally completely worked out the chemistry of the *veratrum viride*, and described

two alkaloids, one soluble, the other insoluble in ether. With characteristic modesty, he did not assign names to these, but in the forthcoming edition of the *U. S. Dispensatory*, it is proposed to call the former *viridia*—the latter *veratroidia*. The present investigation was undertaken to establish if possible the physiological powers of these two alkaloids together with the resin associated with them, and was extended to a partial study of veratria of commerce by way of comparison.

As nothing definite has hitherto been published upon the toxic action of viridia and veratroidia, the first series of experiments was simple, merely tentative as it were, having for its object the study of the symptoms and the post-mortem changes induced by poisonous doses of the alkaloids.

Before detailing these experiments, I desire to express my obligations to Mr. Charles Bullock for preparing and giving me a supply of these alkaloids and the resin of veratrum viride, and to Dr. S. Weir Mitchell for assistance, without which I scarcely would have been able to have carried these experiments to a successful termination. I am greatly indebted to the latter for the loan of instruments, for the counsel of experience, for encouragement amidst difficulties of, to me, a novel line of research, all of which he, with the enthusiasm of a true love for science and humanity, has at all times most generously afforded, grudging not his own valuable time to aid another's efforts.

The preparations of the alkaloids worked with were always sulphates, made by dissolving the alkaloid itself in very dilute sulphuric acid until the solution was nearly neutral to test-paper. It is worthy of remark, that although such solutions were perfectly clear as first made, yet after a time they deposited a copious light flocculent sediment. The nature of this I was unable to determine, but it was probably some impurity with which the alkaloid was so closely united as to impart for awhile its own solubility to it, just as castor oil will cause a certain per cent. of another fixed oil to be soluble with it in alcohol. In using this solution the precipitate was mostly shaken up and the whole injected into the tissue of the animal. In some instances, in which the deposit was filtered out, I could perceive no difference in the effect on the animal.

Experiments with Viridiæ Sulphas.

Expt. 1.—Injected into the thigh of a young pigeon, gr. $\frac{1}{18}$ th of viridiæ sulph.; heart beating 200. 12 minutes. Pigeon quieter; breathing labored; heart 144; pupils unchanged; some trembling. 1 hour. Pigeon as before injection, only quieter; injected in opposite thigh gr. $\frac{1}{3}$ viridiæ sulph. 10 minutes. Violent tremblings, passing in a very few minutes into general convulsions, with loss of power; the limbs were unable to bear up the pigeon, so that it first sprawled, then fell forward and to one side, and finally lay on its back, still having convulsions; the heart's action was exceedingly rapid towards the last; no vomiting or purging; pupils unaffected, responding actively to light until moment of death.

Autopsy immediate.—Alimentary canal and appendages normal; heart firmly contracted; lungs congested; blood dark, coagulating rapidly; brain and spinal cord normal; no signs of irritation at points of puncture.

Expt. 2.—Young pigeon, injected gr. $\frac{1}{3}$ viridiæ sulph.; temperature 108° ; heart's beats not noted. 10 minutes. Temperature 107° ; heart's beats 120. 15 minutes. Pigeon quiet, indisposed to move; heart's beats 76; pupils natural. 30 minutes. Pigeon quiet, disposed to crawl into corners, lying flat on breast; temperature 107° ; rapidity of heart's beat varying constantly; slightest movement or excitement of pigeon causing heart to beat so rapidly it cannot be counted. 80 minutes. Pigeon livelier; injected $\frac{1}{2}$ gr. into its breast. 10 minutes. Pigeon unable to stand firm and quiet, resting on whole length of leg, constantly flapping wings to keep the balance and changing feet, wants to get into corner. 15 minutes. Nervous twitchings of tail. 20 minutes. Evidences of convulsive movement marked. 22 minutes. Convulsions, with sprawling and inability to stand; falling backwards. 23 minutes. Wings flap vigorously, but without raising pigeon at all. 30 minutes. Convulsions marked with increasing weakness; motion backwards and sideways. 33 minutes. Convulsions violent; no change in pupils; pigeon shows consciousness in trying to get into corners and dark places. 35 minutes. Convulsions very violent; now pitches forward all the time. 38 minutes. On back; still violent convulsions. 40 minutes. Pigeon died in hand.

Autopsy immediate.—Nothing abnormal.

Expt. 3.—Full grown white rabbit; injected into its thigh gr. $\frac{1}{4}$; breath rate 140; temperature 103° F.; no perceptible effect.

Expt. 4.—Same rabbit; injected gr. $\frac{1}{2}$; in 20 minutes no symptoms; repeated injection. 10 minutes. Great muscular tremors; acceleration of breathing; pupils natural; almost a tetanic appearance of hind legs, but when taken hold of legs not rigid; he moves with some difficulty. 15 minutes. More marked tremors with weakness; rabbit flat on belly; can't move himself on legs; no rigidity of muscles; loss of power of legs, almost complete in hind legs; certainly no loss of sight or hearing or feeling, apparently perfect consciousness. 20 minutes. Convulsions; not constant but repeated; rabbit squealing with them; no vomiting or purging; all legs sprawling; no marked change in pupils. 30 minutes. Still occasional convulsions with horrible squealing. 40 minutes. More violent convulsions now on side; has lost power of lifting up head, except in convulsions, which are gradually getting more feeble. 60 minutes. Still alive; relaxation more perfect. 90 minutes. Slime running from nostrils; all motion ceased save occasional twitchings and shudders; a small relaxed movement from bowels; no vomiting. 105 minutes. Dead.

Autopsy two hours after death.—Rigor mortis considerable; nervous and alimentary systems normal; lungs intensely congested, very dark, looking as though solid, though really crepitant; heart pretty full of blood.

Expt. 5.—Kitten 3 months old; injected about gr. $\frac{1}{3}$. 8 minutes. Tremblings. 10 minutes. Loss of power, most marked in hind legs; unable to lift itself; constant convulsive movements; injected gr. $\frac{1}{2}$ atropiæ sulph.; heart 120; 17 minutes. Same state. 23 minutes. Pupils widely dilated; heart 160. 25 minutes. All power lost; still convulsive twitchings; I now removed the sternum, no signs of pain; lungs immediately collapsed; heart beating actively continued (10 minutes) until it was removed from body, beat a few times spontaneously after this, and then responded actively to mechanical stimuli.

Remark.—The atropia produced no amelioration in symptoms.

Expt. 6.—Kitten about two months old; injected gr. $\frac{1}{4}$ th viridiæ sulph. At time of injection heart-beat not perceptible, or at least sufficiently so to be counted. 20 minutes. Heart beating violently and tumultuously, heaving chest; 134 a minute. This was after a considerable exertion of the kitten—chasing it, &c. Up to this time only effect perceived was that kitten evidently wanted to be quiet. When it was kept quiet a little time, heart's action was found irregular and much weaker, but still apparently producing more external effect than before injection. 25 minutes. Tremblings very apparent; rocks from side to side in walking, uttering constantly feeble cries; moves slowly, with effort. 30 minutes. Lying flat on belly, with feet stretched out; but when pushed and

excited can walk, but with difficulty—peculiar sprawling, rocking gait. 35 minutes. Gave $\frac{1}{4}$ th gr. more. 40 minutes. Tremblings still more marked; very great loss of power, and tendency to convulsions. 45 minutes. Same; not able to raise itself on legs; no convulsions yet; heart beating tumultuously and irregularly; no impairment of consciousness. 50 minutes. Paralysis has been almost complete in hind legs; cat pulling itself round with fore legs; making a fixed point of hinder extremity; hind legs seem to have no power even in convulsive seizures; convulsions. 60 minutes. Cries and convulsions violent; in convulsions head erect; raised up on fore feet, but hind feet powerless; breathing laborious, panting, noisy. 65 minutes. Mouth open; continued with violent convulsions until about one and three-fourth hours, when kitten died. There was no vomiting or purging; consciousness perfect until very near death; heart continued beating a minute or so after respiration ceased.

Autopsy immediate.—Lungs not much congested; heart full of blood—retaining its irritability; venous system gorged with blood.

Expt. 7.—June 29. Injected $\frac{1}{4}$ gr. of sulphate of viridia into thigh of young, very small, terrier cur. Pulse 160. 8 minutes. Muscular tremors. 10 minutes. Pulse not different from first. 15 minutes. Heart acting somewhat irregularly, 116; accelerated, when muscular tremors now marked come on. 18 minutes. Pulse 108; respirations irregular and so lost in convulsive seizures that I cannot satisfactorily count them. 22 minutes. Pulse 110; heart beat very strong and full to fingers; animal urinating. 25 minutes. Pulse 105; muscular tremors marked. 27 minutes. Pulse 108. Allowing dog to be untied almost unable to raise himself on hind legs; lies flat upon his belly; can only make a few steps when aroused. 30 minutes. Pulse 102; beating him does not make him get up; but he still has pretty good power in front legs—much more than in hind. 35 minutes. Pulse 90. 40 minutes. Pulse 86. 50 minutes. Pulse 75; no convulsions yet. 60 minutes. Pulse 70; dog very weak, with but slight tremors; eyes disposed to be shut and head to fall to one side. 70 minutes. Pulse 72; tremors almost entirely ceased; no vomiting or purging yet. Injected gr. $\frac{1}{4}$ d of the alkaloid in peritoneal cavity. Tremblings recommenced in three minutes. 75 minutes. Pulse 104; dog howling a little; restless; trying to walk. 87 minutes. Injected gr. $\frac{1}{4}$ th into femoral vein. 90 minutes. Convulsion; dog growling, trying to bite; frothing at the mouth; violent, almost tetanic urination; dog sprawling, unable to get up on legs even in convulsions. Pulse under convulsions rising to 140. 120 minutes. No marked change, except breathing has become panting, with tongue hanging out. There is certainly great loss of sensation. 200 minutes. Dog lying on its side; heart pulsations 200; constant violent convulsions; there has been profuse salivation; everything about head wet. 230 minutes. No marked change except dog weaker; injected gr. $\frac{1}{4}$ d into peritoneal cavity; dog perfectly conscious; when one pokes him in side with stick or finger tries to bite. 260 minutes. Heart very irregular, beating 70 a minute and then running up to 120; no change except increasing weakness. 290 minutes. Injected gr. $\frac{1}{4}$ d into peritoneal cavity; animal almost immediately was attacked with wild convulsions, and in a few minutes was evidently dying; heart acting tumultuously and irregularly, frequently stopping for time of several beats; respiration ceased, however, some five minutes before heart.

Autopsy five minutes after cessation of respiration.—Heart congested on right side; left not markedly so; still preserving irritability; venous system engorged with very dark blood. Intestines—vermicular motion very distinct and active; no lesion detected; spinal cord and membrane very pale; as also the brain and its membranes.

Expt. 8.—Snapper (*Chelydra Serpentina*) of moderate size. Exposed heart; beats 32 a minute; injected into pericardial sac gr. $\frac{1}{4}$ th viridiæ sulph. 5 minutes. Heart 32. 15 minutes. Heart 20. 20 minutes. Heart 20; injected gr. $\frac{1}{4}$ d into thigh. 25 minutes. Heart 28. 45 minutes. Same. 60 minutes. Same; injected into pericardial sac gr. $\frac{1}{4}$ th; in 5 minutes, heart 22; 10 minutes, same; 15 minutes, heart 28.

Expt. 9.—Large toad (*Bufo Americanus*). Gave gr. $\frac{1}{4}$ d viridiæ sulph. 3 min-

utes. Absolutely paralyzed all over; no convulsions or convulsive twitchings. 15 minutes. Dead. This experiment was repeated upon another toad with similar results.

Experiments with Veratroidiæ Sulphas.

Expt. 10.—Injected into breast of pigeon gr. $\frac{1}{12}$ th veratroidiæ sulph. Pulse 200; seems to be some irritation at point of injection. 20 minutes. No decided symptoms; gave gr. $\frac{1}{4}$ th additional. 35 minutes. Pigeon quiet; legs weak; sprawling, hardly able to bear him up. Heart beating irregularly; for a few beats at the rate of 60 a minute; on least exertion going off with a whirr, so that the ear could not follow it. Pigeon very weak; trembling; not so much of convulsive thrill as in viridia poisoning. 70 minutes. Pigeon weak; can't maintain itself well on legs; no convulsions or twitchings. 120 minutes. Pigeon convalescent.

Expt. 11.—Pigeon; injected in breast gr. $\frac{1}{3}$ d veratroidiæ sulph.: injections seemed to create local uneasiness; pigeon picking at the wound. 10 minutes. Pigeon very alert, but seems a little weak, and trembling; wants to be quiet, but constantly peering about. 12 minutes. Legs getting weak. 15 minutes. Pigeon apparently greatly alarmed; legs hardly able to sustain it; vomiting. 20 minutes. Pigeon vomiting and purging; weak; convulsed, with wings flapping, tail widely extended, but yet unable to raise itself upon its feet—constantly sitting flat on its leg. 25 minutes. Convulsions constant; not accompanied by constant muscular thrill of viridia, but more jerking; pigeon pushing himself forward in them; consciousness perfect; pupils not affected. 30 minutes. No vomiting or purging for ten minutes; convulsions very violent, driving pigeon rapidly forward as he lays on breast—uttering cries. 45 minutes. No more vomiting or purging; pigeon on back; still convulsed; some muscular thrills; heart beating so fast cannot count it. 60 minutes. No change except increased weakness. 70 minutes. Dead.

Expt. 12.—Dog, with paralysis of hind legs from spinal injury. Gave gr. $1\frac{1}{2}$ veratroidiæ sulph. Dead in fifteen minutes, with vomiting and slight purging.

Expt. 13.—A very large, old, male English rabbit. Cut pneumogastries; respirations immediately went down from 120 to 76 a minute, and became laboured. 10 min. Respiration 80; injected gr. $\frac{1}{6}$ veratroidiæ sulph. 35 min. Respiration 54. 1 hour and a half. Injected gr. $1\frac{1}{2}$ veratroidiæ sulph. 5 min. Breathing about same, but irregular. 35 min. Rabbit weak, with convulsive tremblings. 40 min. Rabbit convulsed, not very violently; no muscular thrill. 43 min. Rabbit convulsed violently. 45 min. Rabbit dead. Respiration ceased a little before heart. No vomiting or purging.

Autopsy two hours after death.—Venous system congested; lungs full of dark blood, crepitant; no ecchymoses; cerebro-spinal axis normal.

So many experiments on various animals with the veratria of commerce have been long since published, that I relate two experiments only from my note-book for comparison with those just detailed. It may be well, however, to state, that although purging is often spoken of as a constant result of a poisonous dose of veratria given hypodermically, yet my experience proves that it is merely an habitual result, and not very unfrequently does not occur. Vomiting I have never known to be absent.

Experiments with Veratriæ Sulphas.

Expt. 14.—A dog, weak from previous experiment, was injected July 22, with veratriæ sulph. gr. $\frac{1}{3}$. 5 min. Dog very restless, showing marked signs of local suffering at point of puncture, licking and nosing it. 10 min. Dog vomiting. 15 min. Dog still sick at stomach, urinating freely and constantly.

20 *min.* Dog purging; no tremors or convulsions. 40 *min.* Injected gr. $\frac{2}{3}$ additional. 60 *min.* Dog purging violently; some convulsions, but not violent or universal, nor associated with general muscular thrills. 80 *min.* Dog dead; respiration ceased ten minutes before heart, which retained its irritability.

Autopsy.—Right side of heart congested; whole venous system full of black blood, highly congested. Stomach—mucous membrane congested. Small intestines—mucous membrane slightly congested; not so much as that of stomach.

Expt. 15.—Pigeon. Injected gr. $\frac{1}{3}$ veratriæ sulph. A slight convulsion; in two minutes dead of universal paralysis.

When a poisonous dose of viridia, or one of its salts, is injected into the cellular tissue of a warm-blooded animal, the first symptom manifested is a desire to be quiet, often a tendency to creep into corners and hide there; an unnatural sluggishness when approached. The whole expression of the face and form shows that this is not cerebral in its origin; the eye is bright, and all ordinary signs of consciousness perfect. The quietness is evidently dependent upon a condition of weakness, which makes movement a painful effort. The next new symptom is, in most cases, the accession of tremblings. These are, at first, slight, scarcely perceptible; but by and by become more apparent. They are accompanied by a great increase of the weakness, the animal often becoming restless from the constant efforts to keep upon its feet. This weakness is certainly, in most cases, more marked in quadrupeds in the hind than the front extremities; in birds in the *legs* than wings. The trembling at first may possibly be due to muscular weakness, but soon it is evidently peculiar; and if the hand be laid on the animal, all the muscles will be found to be in a sort of peristaltic contraction, which runs, as it were, from fibril to fibril, and causes a peculiar, rapidly-repeated thrill. I have never seen this in animals affected with any other poison, nor in the human subject. It is, I think, characteristic of the action of viridia, and is rarely if ever absent.

The next stage is marked by the supervention of convulsions. These are often quite violent. In them a rabbit will run around the room apparently in great pain, or at least squealing violently. They are characterized by clonic spasm of the muscles, and a great absence of real as compared with apparent power. The wings of the pigeon will flap rapidly, and to the eye with great force, and yet fail to raise the body at all. The rabbit, running and squealing, drags his belly on the ground. If one takes hold of the convulsed limb, he finds how little is the force exerted by the muscle, even when apparently in intensest spasm. These convulsions generally continue until death, combined with ever-increasing weakness. The pigeon soon merely drives itself forward in them on its breast. The rabbit painfully progresses lying on its belly, its hind feet, perchance, extended and powerless. Then, no longer able to maintain even this position, the animal lies on its side, and finally, in many cases, on its back, till death puts an end to its sufferings. Consciousness is preserved until the last. Sensibility appears to be unchanged for a time, and then be-

numbed, but not destroyed. In this respect I have thought there was a difference in different animals.

The above course of symptoms is very constant in mammalia and birds, but in reptiles, the convulsions are not nearly so marked, and in some instances are wanting. There is never any vomiting or purging, but frequently, and probably always, profuse salivation. The eyes are unaffected throughout.

The first question which naturally presents itself in this investigation is, how does viridia cause death? through the respiratory system, the heart, or the brain? It is very evident that it is not by any cerebral action. It must be either through the respiratory or circulatory system. A reference to Experiments 4, 5, and 6, will show that the heart continues beating after the cessation of respiration; and the experiments made after this first series and hereafter detailed, confirm this. Death takes place from asphyxia—the result of a failure of the muscles of respiration.

The *post-mortem* appearances give no positive evidence as to the way in which the drug acts, but the total absence of all signs of active irritation of the nervous system, confirms the indication of the peculiar forms of the convulsions and the weakness during life, that its action is one of sedation and not of stimulation.

The action of *veratroidia* and its salts on animals is very different from that of viridia, resembling more nearly that of veratria. There are fewer convulsions than when the former alkaloid is used, and the peculiar muscular thrill is absent. Vomiting is always present and severe, and there is generally purging. Death is produced by a loss of power of the respiratory muscles. Although the physiological action of veratroidia is so similar to that of veratria, it apparently differs from it, very greatly, in its toxic power. Thus in experiment 11 it required 70 minutes for a $\frac{1}{3}$ d of a grain of sulphate of veratroidia to kill a pigeon, whilst the same amount of sulphate of veratria in experiment 15 caused death in two minutes. That the veratrum viride alkaloids worked with were not absolutely pure is, however, certain; but Mr. Bullock assures me they were practically so, that the small amount of impurity contained was not enough to affect the dose.

In regard to the local effect of the injection of these alkaloids, when the sulphate of veratria was employed, there were always evident signs of local pain; when the sulphate of veratroidia was the drug, these signs were much less apparent, and I have never seen the sulphate of viridia produce appreciable irritation.

Second Series of Experiments.—This series was undertaken to discover, first, what was the real action of the alkaloids upon the circulation, and, secondly, in what manner such action was affected; whether by virtue of their influence upon the spinal centres, or independent of it.

The experiments were as follows :—

Expt. 16.—Cur dog of moderate size. Bernard's cardiometer was inserted into the femoral artery. The mercury varied from 120–160 m., rising when the dog struggled to 190 m. $\frac{1}{2}$ gr. viridiæ sulph. was injected into thigh. 15 minutes. Maximum heart force, 120 millimetres. 20 minutes. Dog perfectly passive; heart force 65–95 m., varying greatly, mercury often staying for some time from 65–75, then slowly creeping up, then falling; individual beat only 1–5 c. 30 minutes. Heart force 65–75 m.; individual beat same. Pulse 68; respiration forced and labored. 40 minutes. Injected gr. $\frac{1}{2}$ viridiæ sulph. into peritoneal cavity. 45 minutes. Short, violent convulsion, under whose influence heart force went to 125 m., dropping, after a few beats, to 100 m., and then ranging from 75–100 m.; in a little while after cessation of convulsion settling down at 75 m. 60 minutes. Dog quiet, no more convulsions. 75 minutes. Gave gr. 1 viridiæ sulph., hypodermically. 3 $\frac{1}{2}$ P. M. Dog weak but able to walk; trembling all over. 4 P. M. Gave gr. 1 viridiæ sulph. hypodermically, making 3 grains in all. The next day dog pretty well.

Expt. 17.—I exposed the pneumogastrics and femoral artery, under ether, in a powerful, very thick-necked Scotch terrier. 11.30 A. M. Placed Bernard's cardiometer *en rapport* with the femoral artery. Arterial pressure 120–130 millimetres; heart force (single beat) 5–10 m. Pulse 186; gave, hypodermically, gr. 1 $\frac{1}{2}$ viridiæ sulph. 11.35. Arterial pressure 115–125 m.; heart force 5–10 m. 11.40. Pulse 160; arterial pressure 110–120 m.; dog quiet. 11.45. Pulse 128. 11.55. Pulse 80; arterial pressure, when dog is quiet, 85–105 m., going to 120 m. when dog struggles. I now attempted to cut the pneumogastries. In doing this on the left side, the carotid was cut instead of the nerve, and there was a profuse gush of blood, which, however, ceased in a moment or two spontaneously, aided only by pressure on the outside of the neck. The left pneumogastric was not cut. 12 noon. Arterial pressure 60–70, going up to 100 m. when dog struggles. Pulse 92. 12.5 P. M. Pulse 92; arterial pressure 85–88 m. 12.8. Pulse 92; arterial pressure 80–85 m., going up to 100 m., when dog struggles. 12.15. Pulse 80; arterial pressure 75–80 m., going up to 90 m. when dog struggles. An attempt was now made to kill the dog by cutting the femoral artery at Poupart's ligament. The bleeding, however, ceased spontaneously in a very little while without seriously affecting the dog. The force of the circulation had been so greatly lowered by the alkaloid, that there was spontaneous arrest of hemorrhage in both carotid and femoral artery, without dangerous loss of blood.

Expt. 18.—Inserted Bernard's cardiometer in a moderate sized mongrel dog. Pulse 108; arterial pressure mostly 120–150 m., going down rarely to 110 m., and up to 160 m. 3.15 P. M. Injected gr. 1 veratroidiæ sulph. into peritoneal cavity. 3.20. Dog has active movements, which may be voluntary or may be of the nature of convulsions. Pulse 106; arterial pressure 55–80 m., going up to 95 m. infrequently. 3.22. Dog vomiting violently; a convulsion. 3.25. Dog unconscious; apparently dead, with no perceptible breathing for two minutes; then a half dozen howling, laborious breaths; then quiet. Pulse 30; arterial force 110–150 m., going up to 160 m., the individual beats of the heart greatly exceeding in power anything I have ever witnessed, driving the mercury through 40 m. 3.30. There has been no perceptible breathing for five minutes, except a paroxysm of a half dozen convulsive breathings; during this time pulse rose to 140; most of the time the arterial pressure ranged from 175 to 195 m.; at one time rising to 210 m. The individual beats were very powerful, but nothing like what they had been. 3.31. Mercury fell in cardiometer tube almost instantly; motion ceased; dog dead.

Autopsy.—Brain and medulla congested with dark blood; right side of heart enormously swollen and congested; left side nearly normal; venous system everywhere gorged; blood very dark.

Expt. 19.—Inserted Bernard's cardiometer in femoral artery of a terrier dog; pulse 112; arterial pressure 120–160 millimeters. 11.10 A. M. Gave, hypodermically, gr. ss veratroidiæ sulph. in thigh. 11.15. Arterial pressure 120–160 m.

Pulse 112. 11.20. Arterial pressure 75–90 m., rarely going up to 95 m. Pulse 104. Dog quiet. 11.25. Arterial pressure 75–90 m. Pulse 84. 11.27. Dog vomiting violently. 11.30. Arterial pressure 90–105 m. Pulse 68. Dog vomiting pretty constantly; no convulsions; some very slight twitchings of muscles; no purging. 11.40. Arterial pressure 90–105 m. Pulse 76; some convulsive movements. 11.45. Arterial pressure 110–120 m., going up to 125 m. Dog quiet; not vomiting (hence probably arterial pressure increased). 11.50. Severe paroxysm of vomiting; immediately after this arterial pressure 70–90 m. Pulse 96. In a few seconds arterial pressure 90 to 105 m.; then in a little longer 115–120 m., falling occasionally to 110 m., and going up sometimes to 125 m. Strong opisthotonic convulsions then came on, directly after which arterial pressure fell to 90–105 m. 11.55. Dog quiet; pulse 142; arterial pressure 115–120 m., falling rarely to 110 c., and rising to 130 m. 12 noon. Pulse 140; arterial pressure 100–115 m., going to 130 m. rarely. 12.03. Unfastened dog, pushed him off the table, and he fell as relaxed and stone-like as though dead, but in a little while strove to get up, and, struggling violently, slowly progressed forward, scarcely however raising his belly from the ground. I seized him, and was placing him on the table when he had an extremely violent, persistent convulsion, followed by total unconsciousness, so that touching his glazed eyeball with the finger did not cause closure of the lid. Breathing had apparently ceased; pulse very feeble and irregular. Lying quiet on the table, however, consciousness gradually came back, and the normal sensitiveness returned to his eye. 12.15. Dog breathing well again; pulse 104; arterial pressure 155 to 175 m., going up to 180 m. 12.30. Dog perfectly quiet; not moved for fifteen minutes; breathing regular; pulse 104; arterial pressure 95–105 m., going up to 130 m. Gave gr. ss veratroidiæ sulph. in peritoneum. Dog showed no signs of life when struck or hit. 12.35. Arterial pressure 80–90 m., going up to 105 m. 12.40. Dog vomiting again. 12.45. Dog quiet; pulse 108; arterial pressure 105–115 m., going up to 120 m. 1. Pulse 104; arterial pressure 90 to 95 m., going up to 100 m. The dog was now untied and allowed to lie quietly until he died, some time afterwards.

Expt. 20.—Stout poodle dog. 3.50 P. M. Connected cardiometer with right femoral artery; pulse 160; arterial pressure going up to 130 m.; at times as low as 90 m., generally above 115 m.; single beat mostly 8 m. 4. Gave hypodermically veratriæ sulph. gr. $\frac{1}{2}$. 4.05. Dog struggling, showing marked signs of suffering; howling; breathing, panting, violent; pulse 160; arterial pressure up to 140 m. 4.10. Pulse 155; arterial pressure ranging from 80 to 110 m., mostly below 100 m. Dog strong—howling. 4.15. Dog vomiting—matter vomited greenish. 4.25. Dog vomiting. 4.33. Dog still vomiting; pulse 96; arterial pressure going as low as 50 and up to 90 m., mostly from 60–80 m. 4.36. Gave hypodermically grain $\frac{1}{2}$ veratriæ sulph. Slight convulsive tremors and paralysis. 4.45. Dog quiet; paralyzed all over; constant tendency to vomit; no purging. 4.50. Pulse 72; still making efforts to vomit; very weak. 5.15. Dog dead; no purging whatever.

Expt. 21.—Small cur dog. Exposed pneumogastric nerves and placed cardiometer in femoral artery; pulse 168; arterial pressure 150–158 m.; cut pneumogastriæ, and waited for a considerable time; arterial pressure 146–152 m.; heart force (single beat) 4–5 m.; pulse 184. 5 P. M. Gave gr. $1\frac{1}{2}$ viridiæ sulph. 5.15. Heart force 4–5 m.; arterial pressure, lowest point, between inspirations 115, playing up during extreme struggle and respiratory effort 165 m. 5.25. Pulse 72; arterial pressure falling to 70 m., rising under extreme struggles to get loose, and respiratory effort to 105 m.; during quiescence generally to 80–90 m.; heart beat 10 m. 5.30. Pulse 80, somewhat irregular in frequency; arterial pressure going down to 65 m., under effort up to 95 m. Dog constantly struggling, puffing, with apparently convulsive tremors. 5.45. Pulse 76; arterial pressure as low as 45 m., going up to 75 m. when dog struggles; mostly 50–60 m. 6 P. M. Pulse 68; arterial pressure down to 38 m., going up to 60 m. under struggles; heart force 8 m. The dog was now let up from the table and allowed to go free; died during the evening.

Expt. 22.—Youngish mongrel hound of moderate size. 11.10. Cut pneumogastries; connected cardiometer with femoral artery; arterial pressure 110–120 m.; pulse 176. 11.15. Gave hypodermically grain 1 viridiæ sulph. 11.20. Pulse 172. 11.25. Pulse 176. 11.30. Pulse 164; arterial pressure mostly from 110–115 m., going up to 135 m. in struggles, and down to 90 m. between inspirations, when very far apart. 11.35. Pulse 140. 11.40. Pulse 80; arterial pressure 75–95 m.; when dog struggles going up to 105 m.; occasionally going as low as 70 m. 11.45. Pulse 76. 11.50. Pulse 76; arterial pressure mostly 65–85 m., going up to 105 m. during struggles, and at times as low as 55 m. Convulsive tremors have commenced, moving along muscles very markedly. 12 noon. Pulse 76; very marked convulsive tremors, almost amounting to convulsions. 12.10. Dog in constant violent convulsive tremors, actually shaking the table, succeeding one another constantly, only interrupted by convulsions. Pulse 76; arterial pressure mostly from 65–90 m.; under influence of stronger convulsions up to 110 m.; once, when tremors interrupted for five or six seconds, going down to 50 m. 12.25. General state of dog the same, only convulsions more pronounced; pulse 76, somewhat irregular; arterial pressure 55–75 m., going up to 95 m. under strong convulsions, and when very strong to 100 m.; this rare, not so often as before. 12.40. Convulsions now so violent and constant cannot count pulse; femoral artery obstructed; gave hypodermically gr. $\frac{1}{4}$ veratriæ sulph. 1.10 Dog dead; thirty minutes after injection of veratriæ sulphas; no vomiting or purging.

Expt. 23.—10 A. M. Cut pneumogastric nerve in a small Scotch terrier. 11. Inserted cardiometer. Pulse 132. Arterial pressure 140–150 m.; going up to 165 m. Gave hypodermically, gr. $\frac{1}{4}$ veratroidiæ sulph. There were no signs of local irritation. 11.5. Pulse 128; arterial pressure 130–140 m. 11.10. Dog quiet; pulse 128; arterial pressure 110–120 m., rarely going up to 125 m. 11.15. Dog quiet; pulse 128; arterial pressure 105–110 m., rarely going up to 115 m. 11.23. Pulse 128; arterial pressure 103–107 m., going to 112 m., once to 115 m. Dog quiet, conscious, apparently easy. 11.30. Gave gr. $\frac{1}{4}$ veratroidiæ sulph. 11.35. Pulse 128. When the cardiometer was first connected with the artery the dog was quiet, and the mercury vibrated from 105–110 m.; directly dog was seized with a sort of convulsive paroxysm, growling fiercely, and struggling violently; after this passed off mercury fell to 75 m., finally settling at 80–95 m. 11.45. Pulse 144; arterial pressure, at first 75 m., going up to 95 m., where the blood coagulated; individual beats much weaker than at first. 11.50. Let dog off table; perfectly conscious, tries to get up, but his legs cannot support him. Has no real complete convulsions, but fits of growling, and starting, and efforts to move, probably of that character. Lies on his belly, with head remarkably erect; hairs bristling, but eyes heavy and expressionless. No vomiting or purging. Gave gr. $\frac{1}{4}$ veratroidiæ sulph. hypodermically. 12.30. Dog quiet. Dog died some hour or so afterwards of exhaustion; no vomiting or purging; no new symptoms, simply grew weaker and weaker.

Expt. 24.—Cut the pneumogastries of a good-sized Scotch terrier, and inserted the cardiometer after lapse of half hour or so. 3.45 P. M. Pulse 172; arterial pressure mostly 152–160 m., going up to 165 m., rarely down to 125 m. Gave, by hypodermic injection, $7\frac{1}{2}$ drops of a solution of veratriæ sulph., of the strength of 2 grains to the fluidrachm. Dog seemed immediately to be in great pain, and much excited thereby. 3.50 Pulse 180; arterial pressure as before; dog quiet. 3.55. Pulse 200; arterial pressure mostly from 110–120 m., going up on violent inspiratory effort to 160 m., once down to 90 m. after a prolonged expiration. Dog frothing greatly from the mouth, but not purging or vomiting. 4.5. Pulse 200; arterial pressure mostly from 120–135 m., going up to 150 m. on inspiratory effort. 4.10. Pulse 200; arterial pressure 135–145 m., going to 155 m. on struggling. 4.15. Gave, hypodermically, gr. $\frac{1}{4}$ veratriæ sulph. 4.20. Pulse 200; arterial pressure mostly 140–155 m., blood going up at one time to 170 m., where it clotted. 5.30. Pulse 200; arterial pressure from 155–170 m. 5.40. Dog dead; no convulsions at any time, although there were some convulsive twitchings of the muscles; no vomiting or purging.

Five minutes after death, heart not irritable; vermicular movements of intestines active.

Expt. 25.—Cut pneumogastrics of a stout poodle dog after waiting some time. Pulse 204; arterial pressure mostly from 160–165 m., going up to 180 m. on strong inspiratory efforts, and down to 140 occasionally. Injected into cellular tissue of side gr. $\frac{1}{2}$ veratriæ sulph. 2 minutes. Pulse 206; arterial pressure 160–170 m., going to 125 m. on inspiratory effort, and going down at times to 140 m. 4 minutes. Pulse 196; dog breathing with difficulty and somewhat convulsed; one formed passage. 8 minutes. Pulse 212; placing cardiometer in artery blood went up immediately to 205 and there clotted. No vomiting. 15 minutes. Dog dead; respiration ceased before the heart's action.

Autopsy immediate.—Muscular irritability under the scalpel very marked, the muscles constantly quivering and shrinking as they were cut. All the vein trunks engorged; blood very dark; lungs intensely congested, dusky pink; abdominal cavity and contents normal; brain and spinal cord, sinuses and large veins choked with black blood; all smaller veins in same state, making the passively congested nerve substances very dark on section.

Remarks.—The experiments 16 and 17 show the action of viridia upon the circulation. There was a very marked reduction, both in force and rapidity of movement of the blood, associated with and perhaps dependent upon a great reduction in the rapidity of the heart's action. The force of the individual beat of the heart is at first, I believe, not much affected, it retaining its pristine power for some time after there is a very marked decrease in the general arterial pressure and the number per minute of the cardiac beats. Finally, however, there is also a loss of power in the single beat.

The next question which suggested itself in this connection was, is this reduction dependent upon an influence exerted upon the cerebro-spinal centres, or by some action on the heart itself, its muscular structure, or the sympathetic nerve ganglia contained therein. To answer this, experiments 21 and 22 were undertaken. In these the pneumogastric nerves were cut, and thus all direct connection between the heart and cerebro-spinal axis severed. When the agitation of the operation had subsided, the pulse and arterial pressure were noted, and the sulphate of viridia administered. The same results followed as though the pneumogastrics were entire. This is confirmed by the circumstance noticed in the experiment upon the snapper. The insusceptibility of these reptiles to poison is proverbial, and accordingly no dose of viridia, which I was willing to spare from my little store, injected into the thigh, produced any very apparent result; whereas, several times, a small quantity placed in immediate contact with the organ rapidly caused it to lessen its activity.

The action of veratroidia on the heart seems more difficult of interpretation. In experiment 18 there was a marked depression in the force and rapidity of the blood movement lasting for 10 minutes. At the end of this time, death by asphyxia was rapidly produced, and the circulation underwent a curious change. The pulse in a moment was reduced to a minimum in rapidity, but the individual beat became endowed with four times its normal force; the pulse then rapidly rose to 140—twenty beats be-

yond its pristine number, the individual heart contractions becoming much more normal, but the arterial pressure rising far above what it had been before the administration of the drug. Then very rapidly the mercury fell, and in a moment the heart was stopped and all was over.

I think the most probable explanation of this curious phenomenon is to be looked for in the sudden cessation of the respirations, and consequent rapid production of asphyxia. The increase in the force and rapidity of the heart's action were most probably due to the overpowering of the specific action of the veratroidia by that of the carbonized blood.

In his admirable *Physiological, Pathological, and Anatomical Researches* (p. 33), Dr. Reid has a paper upon the phenomena of asphyxia, from which the following is extracted:—

“When the animal was breathing freely through the tube in the trachea, was quiescent and, when the blood was fully arterialized, the range of level in the mercury in the tube seldom exceeded half an inch, sometimes not so much. When the stopcock was shut no change took place in the range of the mercury during the first half minute; generally, before the end of the first minute the animal had begun to struggle, and then the range greatly increased—rising during each attempt at expiration, and during the struggling of the animal. In some of the experiments the range of the mercury amounted to about nine inches, and in one experiment to ten inches.”

“In a third experiment, the pulse was 100 before the stopcock was turned; at the end of one minute the blood was getting dark, the animal had begun to struggle, and the pulse was 120. During the second minute it struggled violently, and the pulse could not be reckoned. At the end of $2\frac{1}{2}$ minutes the animal ceased to struggle, the respirations were few and heaving, and the pulse was 78.”

In Experiment 19, the primary period of depression ended in a gradual increase in the frequency and force of the pulse, which had risen to 140 instead of 112 a minute, the number before its administration, but had not quite regained the force which it had had previous to the use of the drug, when a period of collapse and apparent death came on. After reaction from this, however, the circulation more than regained the power which it had at first. A further dose of veratroidia was followed by the same depression and subsequent rebound of the circulation. The indications do not in this case point so clearly to the accumulating carbonic acid as the cause of the secondary arterial excitement, but I cannot help believing it has something to do with the latter.

Experiment 23 was undertaken to discover whether the action of veratroidia on the heart is exerted through the pneumogastrics or not. It is much to be regretted that the small quantity of the alkaloid in my possession limited me to a single experiment. The first period of depression was, however, very well pronounced, and leaves no doubt but that the veratroidia produces this effect by direct action on the heart or its sympathetic ganglia. There was subsequent increase in the rapidity but none in the force of the circulation, when the cardiometer became disarranged. It is,

therefore, left uncertain whether the secondary exaltation is produced through the spinal nerves or not.

Sulphate of veratria depresses the circulation both in force and frequency, but not nearly so much as viridia, at least without the production of other violent and distressing symptoms. The depression is constant; constantly increasing until death. Experiments 24 and 25 show that this action must be through the spinal nervous system by means of the pneumogastric nerves. Veratria acting apparently as a direct excitant to the heart when the connection of the latter with the spinal system is severed. The suggestion naturally presents itself, is this increase owing to the action of the veratria or to the accumulation of carbonic acid in the blood. Further experiments will be necessary before this question can be positively answered, but the fact that the increase in the rapidity and force of the pulse commences almost simultaneously with the absorption of the alkaloid indicates that the latter is the immediate cause of the increased arterial action; that the veratria is either a direct irritant to unstriated muscular fibre or to the nervous cells contained in the heart structure.

The next point to which inquiry was directed, was to *whether the paralysis produced by viridia and veratroidia was due to action on the nerve-centres—on the connecting nerves or on the nerves themselves.*

Expt. 26.—Rana fontinalis—calico frog—adult. Injected gr. $\frac{1}{8}$ viridiæ sulph. at 9.50 A. M. 9.55. Frog bellowing at intervals; making great efforts, cannot say whether voluntary or convulsive. 10. Mostly quiet; lays on side, with occasional great convulsive leaps. 10.3. Apparently paralyzed; crying; with convulsive motions, but perfectly motionless and relaxed when lifted out of water. 10.5. Almost dead. Eyes scarcely close when touched by probe; no signs of sensation when cut or touched. Crural nerve exposed; when pinched, violent spasm of leg; when placed on a silver probe and one end of steel forceps touched to it and the other to probe, the exceedingly slight galvanic current sufficient to produce violent spasm of leg; once a general convulsion seemed to be produced, probably an accidental coincidence, as could not be produced again. 10.10. Reviving. 10.13. Livelier; gave gr. $\frac{1}{8}$ additional. 10.20. No signs of life for 15 minutes; muscles of leg still respond actively to irritation of nerve. 10.25. Spinal marrow, irritation of it by a point gives rise to some *faint* twitchings in leg muscles; no amount of irritation produces motion elsewhere or more pronounced. 10.30. Crural nerve still very excitable. Opened thorax, heart beating 50 a minute; no other signs of life. 10.35. Powerful irritation of spinal cord produces still slight twitchings.

Expt. 27.—Rana fontinalis—calico frog—adult, but small. 8.8 P. M. Respirations 68 per minute; injected gr. $\frac{1}{8}$ viridia sulph. 8.12. Some rigidity. 8.20. Respirations 36, irregular. Consciousness perfect, but frog quiet; moves with great difficulty, unable to leap; sensibility apparently slightly affected; some rigidity. 8.22. Sensibility very imperfect. 8.25. Frog quiet, with an occasional apparently convulsive kick. 8.30. Exposed crural nerve; very faint galvanic current elicited active convulsions in limb; a very powerful one failed to produce any movements in other parts of the body. 8.35. Respiration 32, very irregular. 8.40. Sensibility totally abolished, also power of motion. 8.45. Excitation of spinal cord by a moderate current produces marked but not violent, general, diffused, muscular contractions. 8.50. Feeble galvanic current to crural nerve produces contractions in the limb, but no amount of stimulus

produces contractions elsewhere. 8.52. Exposed heart, which stopped beating at 8.57. After death muscular irritability perfect.

Expt. 28.—A large bullfrog—*Rana pipiens*—gave hypodermically gr. $\frac{1}{6}$ viridiæ sulph.; waited some time without apparent effect. 4.15 P.M. Gave gr. $\frac{1}{6}$ additional. 4.20. Frog lies quiet in water, not disturbed so readily. 4.23. On taking out of water, very weak and relaxed; on ground cannot spring half his regular distance, and falls heavily upon the ground. 4.25. Almost lost power of jumping; lies flat on his belly; when placed in water not able to keep his nose above it, save by constant struggling. 4.30. Very weak; muscles relaxed, flaccid, at times, however, becoming rigid; in a sort of clonic spasm, which would affect only certain muscles of one limb for a minute or so, and then would leave there and appear in another limb; no marked convulsions. 4.40. Frog so relaxed that when placed upon the back in water lies there, or very slowly rolls over. Exposed to sight crural nerve; placing it on a silver probe and applying one point of moist steel forceps to nerve, another to the probe a little distance off, the very feeble galvanic current was sufficient to cause active contractions of the muscles. 5 P.M. Frog lost all power of motion, except some slight convulsive sudden extensions of single limb. Left crural nerve as excitable as the right had been; muscles responding actively to steel forceps and silver probe.

Expt. 29.—Small calico frog—*Rana fontinalis*. 4.45 P.M. Gave hypodermically in left thigh gr. $\frac{1}{4}$ of sulphate of veratroidiæ. 4.48. Frog disposed to be quick; when pricked with needle jumps pretty well; left thigh extended and somewhat rigid. 4.55. Frog cannot spring or lift himself. 5 P.M. When laid on back frog cannot right himself. Galvanization of crural nerve causes vigorous contractions of muscles of legs; no signs of pain when cut. 5.15. All voluntary motion has been suspended for some time; muscles move powerfully when galvanized some, but less so when crural nerves are galvanized, owing, probably, to previous exposure and repeated galvanization of nerves.

Expt. 30.—Large calico frog—*Rana fontinalis*. 3.25 P.M. Frog can leap $3\frac{1}{2}$ feet; gave about gr. $\frac{1}{4}$ veratroidiæ sulph. 3.28. Frog disposed to be quiet, cannot leap more than $1\frac{1}{2}$ to 2 feet. 4. Frog very weak; made two or three leaps of 2 feet each, but so exhausted refused to move when struck or pinched; gr. $\frac{1}{4}$ additional administered. 4.5. When laid on back in water struggles consciously to get on belly; after some time able to do it. 4.20. Very little change in frog's condition; gave gr. $\frac{1}{6}$ additional. 4.35. Frog croaking faintly; some convulsive movements, apparently vomiting quantities of thick slime; weak aimless movements when laid on back. 4.45. Frog motionless; only occasional convulsive efforts. Crural nerve exposed; muscles of leg responded pretty well to feeble galvanic current through nerve.

Remarks.—Experiments 26, 27, and 28 show that the viridia produces paralysis not by an action exerted upon the conducting nerves or the muscular tissue. The excitability of the nerves seems in some cases to be even increased, and the muscles respond vigorously to stimuli. Reflex actions appear, however, to be almost entirely suspended. I have never seen but the faintest indications of them. Sensation appears to be diminished although not so rapidly as motility. When the nerve centres are examined after death from viridia, they are always found pale or else passively congested with dark blood. It is evident that viridia exerts a powerful direct or indirect action upon the spinal cord, and the post-mortem appearances agree with symptoms during life in determining that such action is of the nature of sedatives. It is possible that the depression of the circulation may be the immediate cause of the failure of nerve power. My experiments do not positively settle this, but certainly indicate very

strongly that viridia exerts a direct influence upon the motor nerve centres. The loss of power commences very early and progresses very rapidly, and is entirely different in its whole course from that seen when one of the cardiac poisons proper has been used. In their recent paper on the "Application of Physiological Tests for Digitaline," Drs. Fagge and Stevenson sum up the effects of a cardiac poison as follows: 1. Peculiar form of irregularity in the cardiac beats; 2. The stoppage of the ventricle in the white contracted state; 3. The retention of the voluntary power at the moment when the pulsations of the heart first cease, and for at least 15 to 20 minutes afterwards; all of which symptoms are utterly different from those produced by viridia.

The results obtained by the recent investigation as to the physiological action of the latter alkaloid, may be summed up as follows:—

1. It appears to be but very slightly, if at all, locally irritant.
2. It has no action whatever upon the alimentary canal; never producing either vomiting or purging.
3. It exerts no direct influence upon the brain, and the pupil is not affected by it, except it be an indirect dilatation just before death.
4. It is a spinal motor depressant (probably directly so), producing death by paralysis of the respiratory nerve centres, and is without action on the muscles or nerves.

5. It is a direct depressant to the circulation, lowering the force and rapidity of the blood streams, slowing the action of the heart and finally affecting the force of the single beat independent of any spinal action it may exert.

Veratroidia appears to be physiologically as well as chemically in many respects midway between viridia and veratria; locally it is more irritant than the former, less so than the latter. It possesses somewhat similar powers to the former on the heart, although to a less extent, and seems midway between the two alkaloids in its action on the nervous system and muscles, acting chiefly on the spinal centres, but appearing at the same time to impair the conducting power of the nerves and the irritability of the muscles.

Its influence on the animal may be summed up as follows:—

1. Locally it is somewhat irritant.
2. It is an irritant emetic and sometimes cathartic.
3. It exerts no direct influence upon the brain or upon the pupil.
4. It is a direct spinal motor depressant, producing death by asphyxia, and acting at the same time to some extent upon the conducting nerves and the muscles.

5. It depresses the heart's action both in force and frequency, but the period of depression is followed by one of reaction, its primary cardiac action being independent of its spinal influence.

Resin of Veratrum Viride.—Before the labours of Mr. Charles Bul-

lock, the resin, so called, of veratrum viride had been shown to have the power of depressing the pulse, but it had been freely conjectured that this resin was really a complex body containing a distinct alkaloid. This is now known to be the case. After this alkaloid is entirely taken out of the resinoid mass, there remains, however, a dark substance soluble in alcohol, which appears to be the pure resin of the plant. It is a matter of much interest to determine whether this purified resin has any action on the economy, and if so, what it is.

Mr. Bullock's experience with it is as follows:—

“One-third of a grain of the resin dissolved in alcohol was taken every half hour until one grain was administered. No effect on the circulation or other result was noticeable. On a second trial the same dose was administered at the same intervals until two grains were taken. No effect on the pulse in force or frequency was observed; the only result—an unexpected one—was great prostration of the digestive functions, subjecting the experimenter to a temporary but severe attack of dyspepsia. Not being familiarized with this popular complaint the experiment was not pushed farther.”—*Am. Journ. Pharm.*, 1868, p. 64.

In order to determine, if possible, the action of the resin still more conclusively the following experiments were instituted.

Expt. 31.—October 21, 3.35 P. M. Pulse 80; I have just taken gr. j alcoholic resin of veratrum viride. 4. Stomach feels mawkish and slightly nauseated; pulse 82. 4.15. Took gr. j additional. 4.30. Pulse 76; slightly nauseated. 5. Pulse 80; still feel slightly nauseated. 5.20. Took two grains additional. 6. Pulse 76; nausea marked, relieved at times by eructations of wind. At 6½ P. M. I took supper, although food was repugnant to me, and I ate but little. All through the evening I suffered from decided dyspepsia, partially relieved by a glass of whiskey. A feeling of tightness, nausea, stomachic wretchedness, with frequent eructations of wind, were the main symptoms. The pulse was not manifestly affected, nor were there any indications, save those mentioned, that I had taken anything unusual.

Expt. 32.—Gave gr. ½ of resin of veratrum viride dissolved in alcohol to an adult pigeon by stomach. 10 minutes. Pigeon vomiting, no purging. 15 minutes. Pigeon vomiting violently. 20 minutes. Pigeon still vomiting. 30 minutes. Pigeon still vomiting violently. 35 minutes. Pigeon vomiting violently in paroxysms, no other appreciable symptoms. 40 minutes. Vomiting ceased. There were no other appreciable symptoms, save the depression of the vomiting, but it was several days before the pigeon recovered from this.

Expt. 33.—Gave gr. j alcoholic resin in alcohol by stomach to a half grown English rabbit, no perceptible effect.

Expt. 34.—4.30 P. M. Gave by stomach 8 grs. of resin dissolved in f3ss of alcohol to a full grown English rabbit; rabbit resisted vigorously, and did not get, I think, more than 4 grs. Immediately after operation, animal very weak, scarcely able to move; heart acting somewhat irregularly; breathing slow, laboured, with open mouth; probably some injury to glottis during active resistance to passage of tube. 5. Rabbit much in the same condition, but a little livelier and breathing less labored; no vomiting or purging. 6. Rabbit better; running about some, although same peculiar labored breathing. 7. Rabbit more lively, hopping about a little, but with breathing worse, now accompanied by a peculiar groan-like noise. 10. Animal a little livelier, but with same difficulty in breathing, evidently, I think, caused by injury to throat; no purging or vomiting. The next morning the rabbit showed unmistakably that his larynx had been severely injured, and there can be no doubt but that there were no appreciable symptoms induced by the resin.

Remarks.—These experiments show conclusively that the resin of veratrum viride has no effect upon the circulation ; that it is inert so far as the medical virtues of the plant are concerned. That it has some local action upon the stomach is indicated by the violent vomiting it induced in the pigeon, and the gastric disturbances it caused in the human subjects. That it is the resin which produces the distressing vomiting often seen when the fluid extract or tincture of veratrum viride has been taken is, I think, however more than doubtful. Its action is probably not powerful enough in the small quantities given to do more than aid and abet its more active compeer, veratroidia. Still, as it does aid that alkaloid in its unpleasant action it is an object to get rid of it, as far as practicable, in any preparation of the drug.

Therapeutical Remarks.—The experiments which have been detailed prove, I believe, that in viridia, the profession has a remedy, by means of which all the peculiar sedative influence of veratrum viride can be obtained, without the horrible nausea and vomiting which always occasion so much discomfort, and which in some instances endanger life. As an instance of the latter, it is perhaps admissible to speak of a case of remarkable recovery which came under my notice. A woman had had her abdomen torn by an enraged bull, so that nearly the whole of the sigmoid flexure of the colon was protruded and covered with dirt. It was carefully washed, replaced, and the external wound sewed up. Opium and veratrum viride were freely administered ; her pulse was kept to about 40 per minute, I believe, for some days, and she recovered without general peritonitis. The greatest constant source of anxiety in the case was the vomiting induced by the American hellebore, which threatened to tear open the wound. It is in such cases that viridia will be especially useful. No experiments on animals are absolutely satisfactory unless confirmed upon man himself. There is, however, in the present instance not so much need of this comparative study upon man, as it has already been abundantly shown that the crude drug acts similarly upon all the domestic animals, including the *genus homo*. Moreover, it is well known that the veratrum viride is a direct arterial sedative to man. I have had no opportunity of using the alkaloid therapeutically, but have instituted the following experiment upon myself.

Before detailing this, however, I quote the results of Mr. Charles Bullock's experiments, extracted from his paper in the *American Journal of Pharmacy*, 1868, p. 98 ; reprinted from the Proceedings of the American Pharmaceutical Association :—

“A more extended experience is desirable to attest the effects of this alkaloid. Several trials were made by administering it to persons in health ; the results of the experiments are as follows : One-fortieth of a grain of the alkaloid dissolved in alcohol was administered every quarter of an hour, until one-eighth of a grain was taken ; half an hour after taking the last portion the pulse in each case was reduced from eight to twelve

beats in the minute. No nausea or other effects were experienced. An impression was produced on the throat resembling that caused by pyrethrum, and the benumbing effects of aconite were wanting."

Expt. Oct. 17. Pulse. 85 in a sitting posture. Took, 11.40 A. M., gr. $\frac{1}{8}$ th viridiæ sulph. in aqueous solution. Taste bitterish, disagreeable, peculiar—reminding one of the odour of spermatic fluid. 12 noon. No reduction of the pulse; ever since swallowing dose there has been a persistent, peculiar numbness in the fauces. Took gr. $\frac{1}{8}$ th additional. 12.15. After second dose the numbness of fauces was for awhile very marked; not so much so now; a general feeling of languor and quietness; a sense of exertion in going up stairs. 12.35. No reduction in number of pulse; took gr. $\frac{1}{8}$ th additional. 1 P. M. Pulse when quiet, 76 per minute; numbness still persists in fauces. 1.40. Pulse about the same; took gr. $\frac{1}{8}$ th additional; eaten heartily since last observation. 2.10. Pulse 80; took gr. $\frac{1}{8}$ th additional. 2.40. Pulse 74; numbness of throat not noticeable. 3.15. Pulse 69; took gr. $\frac{1}{8}$ th additional; no sickness of stomach. 3.40. Pulse 66. 4. Pulse 72; took gr. $\frac{1}{8}$ th additional. 4.30. Pulse 73; took gr. $\frac{1}{8}$ th additional. 5.15. Pulse 67; decided feeling of weakness; no other symptoms. 5.30. Pulse 68; any exertion an effort, and when forced rapidly sending pulse up to 110. Walking once or twice around a room sufficient to do this. 6. Pulse 70; any exertion painful. Dr. Allen coming in, asked what is the matter; you look so languid. 6.15. Pulse nearly 70—down at times to 62. 6.20. Took two ounces of brandy. 6.40. Just finished supper; pulse 66. 7. Pulse 70; no digestive disturbance or other symptom has been manifested at any time since taking medicine, save only in the slowing of the pulse and the marked, pleasant muscular languor. The benumbing of the throat appeared to be caused by the contact of the medicine in swallowing, and there was no tingling sensation, such as is felt when under the influence of aconite.

As far as can be judged from these few experiments upon man, the commencing dose of viridiæ sulph. may be set down at the sixth of a grain, repeated every hour, and increased until the desired end has been reached. I have never observed any marked cumulative effect—by which I mean in this connection—any very marked increase of the symptoms by small doses when the alkaloid is given every hour. The effect of a single moderate dose does not appear to be very long continued, reaching, I believe, its maximum in about an hour. Further experience upon this point is however necessary; a study of the action of the medicine in disease alone can settle it. I believe the alkaloid to be preëminently safe as compared with other remedies with equal power, *i. e.*, it would be much safer to reduce the pulse rapidly 20 beats per minute, and the force of the blood stream correspondingly, with it, than with any other known remedy, and I therefore ask for it a speedy and thorough trial by hospital physicians. Owing to the immense loss of the alkaloid by the methods of preparation which have hitherto been pursued, the expense of manufacture is at present great, but there can be but little doubt that the stimulus of demand would call forth from Mr. Bullock or some other pharmacist new methods, obviating this loss, and that the alkaloid could be furnished at a very reasonable rate.

If any case of poisoning from it should arise, the treatment should be such as would be suitable were veratrum viride itself the agent. Perfect quiet in the horizontal position; brandy and ammonia freely; opium, or perhaps better still, atropia cautiously; and, on general principles, strychnia.

ART. IV.—*On the Diagnostic Value of the Corpuscular Blood-Elements in the Urine of Bright's Disease.* By JOSEPH G. RICHARDSON, M. D., Microscopist to the Pennsylvania Hospital, Philadelphia.

Most general practitioners of medicine, when called upon to investigate an obscure case of Bright's Disease, have probably felt the want of some more definite guides to the exact condition of the kidneys than those furnished by the proportion of albumen in the renal secretion, or the character of the tube casts which the urine contains; and although it seems at first sight an arduous task to attempt supplying the student with any additional aid beyond that afforded by the admirable manuals published by Doctor Dickinson, and, more recently, by Doctor Grainger Stewart, yet my connection with the hospital has enabled me to carry on some researches which, enlightened by the new discoveries in regard to pus and mucus, may serve to render certain doubtful cases of this affection somewhat clearer than they would be without such assistance. It seems remarkable, indeed, how meagre are the references to the diagnostic importance of blood in the urine made in the monographs above mentioned; the former of these gentlemen observing in respect to casts (p. 18): "If pus [white blood] cells are included, the inflammatory or catarrhal state has taken such hold of the tubes that the epithelial cells are replaced by pus globules. Blood globules will show that there has existed enough congestion to rupture the Malpighian capillaries." While the latter dismisses the subject with little more than the statement (p. 15): "And, lastly, some [casts] are found in which blood corpuscles in varying quantity are present. Along with the tube-casts, and sometimes in large quantity, blood corpuscles altered by the action of the fluid in which they lay [*sic*], are found."

As, however, the important advance in pathological science, to which I have alluded, is still spoken of in this country under the title of "Cohnheim's alleged Discovery," it may not be unnecessary to advert briefly to its merits and the testimony which supports it. Dr. Cohnheim, as the readers of this Journal are aware (see number of this Journal for Oct. 1869, pp. 549-552) first published his theory of Inflammation, and detailed the original and ingenious experiments from which it was built up, in a leading article in *Virchow's Archives* for September, 1867, which soon attracted everywhere the notice of histologists. According to Cohnheim the process of pyogenesis consists first, in a partial interruption of the flow of blood by which the red corpuscles move more slowly through, or almost block up, the capillaries, while white globules adhering to the parietes of the vessels arrange themselves in a layer upon this inner surface of the walls; and second, in the "wandering out" of these white blood cells through the stomata, demonstrated by Recklinghausen in the walls

of the finer bloodvessels by virtue of that amœboid movement which is one of the most remarkable attributes of the white blood corpuscle, and so aptly illustrated by an English commentator on Prof. Huxley's lecture upon Protoplasm, when he explains the process of an amœba taking a minute diatome into its substance for food, by comparing it to a lump of dough growing of itself gradually around an apple to make an apple-dumpling: the white blood corpuscles which have thus wandered out then constitute with exuded serum that yellow fluid, so long known under the name of pus, and hitherto generally supposed to be a product of the breaking down of tissue. In support of this doctrine experiments upon frogs and rabbits paralyzed by woorara are described in which the mesentery of the animal being exposed and spread out upon the field of the microscope, multitudes of white corpuscles were *seen* in all stages of transit from the interior to the exterior of the vascular walls, in which latter position they constituted ordinary pus globules.

Of course such a novelty in medical science has met with numerous assailants, among whom the most prominent seems to be Prof. Kolman Balogh, of Pesth, who, in an article in *Virchow's Archives*, (Erstes Heft, Band xlv. S. 19, u. s. w.), asserts that in spite of the most prolonged and careful attention not once could he see the transit of the white blood cells through the stomata in the vascular walls, which he thinks if they exist are such minute pores that they can give passage only to fluids. His observations are, however, sharply commented upon by Dr. A. Schklarewski, of Moskow, in the following volume of the *Archives* (Band xlvi., Hft. 1, S. 116) and Cohnheim's experiments appear (*Transactions of Pathological Society of London*, vol. xix. p. 467) to have been repeated before the London Pathological Society in April, 1868, by Dr. H. Charlton Bastian, of London, with entire success. In our own country Lieut. Col. J. J. Woodward, Surgeon U. S. A., stated during a lecture at the Philadelphia College of Physicians, May 31st, 1869, that the experiments of Cohnheim had been tested under his direction in the Surgeon-General's Office at Washington, and that he had found the description of phenomena singularly accurate; the observations on frogs being fully corroborated, as far as they had time to repeat them, in every particular, and Dr. William F. Norris, of this city, but for some years past residing in Germany, in an article now in press, detailing observations made, chiefly on the corneæ of frogs, in conjunction with Prof. Stricker, of Vienna, while maintaining that some of the corpuscles of pus originate in the proper cells of the tissue, admits as indubitable, that many are in reality white blood globules which have made their way through the walls of the vessels, as Cohnheim describes.

It has been urged, however, by some assailants of this doctrine, that even admitting, for the sake of the argument, Cohnheim's views on inflammation to be correct as regards the inferior animals, upon which his experiments

were tried, there is no proof that the same ignoble process of suppuration affects man, a creature of such far higher attributes; but, on this point I trust that my own experiments, published in the *Pennsylvania Hospital Reports* for 1869, will be found conclusive. By diluting a drop of my own blood upon a slide, with pure water introduced at the margin of the thin glass cover, and thus reducing the liquor sanguinis to the specific gravity of the saliva, I found it quite possible to watch every step of the change, in which by mere distension the white blood cell is converted into the salivary corpuscle, with its one, two, or three nuclei, its actively revolving molecules confined by a cell wall of exceeding tenuity, capable of presenting all the phenomena of deep-staining of the nuclei with the entire cessation of movement on the addition of aniline dye. In like manner, when the liquor mucii and liquor puris are similarly diluted their corpuscles are also seen for the most part to be converted into salivary globules, and I infer therefore that we may regard the strong presumption afforded by Cohnheim's experiments upon the rabbit as established into a fact, and conclude that most (at any rate) of the corpuscles of *human* pus are simply white blood cells which have wandered out through the vascular walls.

But interesting as these researches are from a scientific point of view, it is only as they can be applied to diseased states of the human organism that they become of real importance to the physician; and my object in the present paper is to make some practical deductions in regard to the congestive and inflammatory processes undergone by the kidneys during the course of Bright's disease. I find, however, that some of the experiments I had planned in relation to this subject have been anticipated by Prof. Axel Key, of Christiania, Sweden, who, in a paper partly translated for the columns of the *Medical Times and Gazette* for May 22d, 1869, p. 542, "On the Behaviour of the White Blood Cells in Inflammation of the Kidneys and Lungs," informs us that by setting up inflammation of different grades in the kidneys, and at the same time throwing cinnabar injections into the blood, he was enabled to follow the white blood cells in these processes; he believes that even in slight irritation the white blood cells, without interstitial changes and without hemorrhage, escape from the vessels into the renal glomeruli, and force their way into the tubes, sometimes one by one, and sometimes several together, and are found in the urine under the appearance of pus cells. Unlike Cohnheim, he thinks it is an absurdity to consider the white blood cells as pus corpuscles under all circumstances as soon as they have left the walls of the vessels, and is of the opinion that he has found that the leucocytes may remain on the lining membrane of the tubules, and develop into epithelium. He further states: "In morbid changes in the kidneys, the cells which have migrated from the glomeruli and from the interstices into the tubes, and which resemble pus cells, may occur in great abundance in the urine, both isolated

and forming whole cylinders, without the slightest trace of suppuration or actual pus formation being discoverable in the kidneys." These views in regard to the significance of pus (white blood) casts, contradictory as they are, not only to the opinions of older authorities on Bright's disease, for example George Johnson (*Diseases of the Kidney*, p. 418), but also to those of recent writers, such as Beale, Dickinson, and Grainger Stewart, nevertheless fully coincide with my own clinical observations as will be seen in the sequel. It will perhaps be objected as before, however, that since they were made upon inferior animals alone, they afford no proof that the same changes occur in man, yet this doubt can be easily set at rest by a simple modification of my experiments, such as diluting specimens of fresh human urine containing pus or mucous globules, until a hydrometer immersed in the fluid marks the specific gravity of 1005, when on examination with a sufficiently high power the ordinary salivary corpuscular form of the white blood cell may be readily detected.

If now, aided by these various researches, we endeavour to trace the course of renal inflammation in its simplest form, that from traumatic irritation, we are led to conclude that a first departure from a state of perfect health may originate in the mere mechanical effect, through pressure, of some foreign body, such as a small uric acid calculus, or a plug of adherent white blood corpuscles, acting exactly like the hot iron or filament of thread used by Cohnheim to set up inflammation in the cornea of the frog. This produces a partial or complete stasis of the blood in the neighbouring vessels, whose first or least amount results in the migration of a few leucocytes and the exudation of liquor sanguinis, which, mingling with the urine, renders that fluid slightly albuminous; the second or medium degree in the formation of tube casts called fibrinous (sometimes it appears to me on insufficient evidence), and the abundant "wandering out" of the white (accompanied by a few red) blood cells through their power of amœboid movement, as described by Cohnheim, and well known to occur in inflammation of mucous membranes analogous to that lining the uriniferous tubules; lastly, when of its third or highest intensity, in the free escape of the red blood disks in addition to the other elements alluded to, either *per rhexin* or by their peculiar mode of exudation through the walls of the minute capillaries.

As examples of the first of these forms occurring in other tissues of the human organism, may be instanced the anasarca produced by an abdominal tumour obstructing the reflux of blood through the vena cava, the œdema of the eyelids in the forming stage of hordeolum, and the flow of transparent serous fluid during the early period of an ordinary cold in the head.¹ The second is illustrated by the secretion of pus in acute cys-

¹ Dr. Dickinson quotes (*Pathology and Treatment of Albuminuria*, p. 15), Dr. George Robinson of London, as having proved experimentally on animals that

titis, or its development in an ordinary phlegmon ; and the third finds its analogue in the mingled pus and blood discharged from the mucous membranes during the height of an attack of gonorrhœa and rarely of virulent ophthalmia. Of course, like the inflammatory process in other portions of the system, nephritis may terminate naturally by resolution, or be cut short by successful treatment in either the first or second stage, as above described ; a restoration of the affected parts to perfect health, doubtless so terminating as a rule in the gradual retrograde manner, we daily observe in convalescence from an attack of inflammation of the conjunctiva or of the Schneiderian membranes. It would seem, however, that white blood corpuscles imbedded in delicate hyaline casts, as well as floating freely in the urine, may rarely continue to occur for some time after the ordinary symptoms of Bright's disease disappear, being perhaps merely the results of previous inflammation from time to time washed out of the uriniferous tubules, as probably took place in Case VI., below detailed. It must by no means be supposed that I mean to assert the process of inflammation in the living organism presents such sharply-defined stages as those above described ; on the contrary, just as a naturalist is perplexed when called upon to draw the dividing line between the animal and vegetable kingdoms, so the morbid anatomist, and *à fortiori* the physician, will occasionally meet with cases of nephritis, where it is almost impossible to decide the grade of inflammatory action. It would appear, however, that such examples are exceptional, and that in a large majority of instances the unhealthy condition can be classed in one of the three categories just mentioned. Indeed, on seeking to arrange the collection of facts I have gradually accumulated in regard to Bright's disease during numerous examinations of specimens from patients in the hospital wards, and also in the private practice of medical friends, as well as in my own, I find most series of phenomena are capable of being grouped together in accordance with the views above expressed, and serve to elucidate one among the many important applications of which the doctrines of Cohnheim are susceptible.

In order, however, to determine from microscopic examination of the urine, not only the grade of inflammation, but its tendency (*i. e.*, whether advancing or retrogressive), several observations upon specimens obtained at intervals of a day or two will generally be necessary, and that they may afford the greatest assistance in diagnosis, these should be made comparative in their character. The method I have been led to adopt for the accomplishment of this object has at least one merit, that of simplicity, as will be seen by the following description : The sample of urine to be

albuminuria resulted from ligature of the renal vein, and Dr. Grainger Stewart (*Bright's Disease of the Kidneys*, p. 33) has confirmed this statement by his own observations.

tested is placed in a conical graduated measure of at least four fluidounces capacity, carefully covered and allowed to remain undisturbed for twelve hours, when the bulk of deposit is noted; a small amount of the sediment is removed from the bottom of the vessel by means of a glass tube drawn off to a moderately fine point, two or three of the last few drops that have entered allowed to escape and the outside of the pipette wiped dry; a minute portion of the remaining contents is then deposited upon a slide, covered with a square of thin glass measuring exactly half an inch across, and the surplus moisture absorbed from the margin of the covering glass by a soft linen rag, great care being taken to avoid movement of or pressure upon the square. It is obvious that by adjusting a slide thus prepared upon the stage of the microscope, so that for instance the right upper corner of the cover shall occupy the field of view, and by means of the horizontal stage movement running it across until the left upper corner appears, then raising the stage with the vertical movement the width of a single field, reversing the horizontal motion as far as the right border, and so on, every part of this film of fluid measuring one-fourth of one square inch may be examined and the number of its contained red and white corpuscles, tube casts, epithelial cells, &c. accurately ascertained. The apparent magnitude of this surface when viewed under a one-fourth inch objective giving an amplification of two hundred diameters will, of course, be nearly seventy square feet, so that time would be needlessly wasted in enumerating all the cells, &c. seen in such an area, except when very sparsely distributed; if abundant, counting those seen in a few fields, or even in sundry thousandths of an inch (as marked off between the threads of the cobweb micrometer), and noting the average, will often answer every purpose. Although for estimations of this kind a quarter of an inch objective is amply sufficient, I have constantly found great advantage from a subsequent examination with a very high power, afforded by an objective of much shorter focus, for while by deeper eye-piecing an equal enlargement may be obtained, yet obscure points of structure can be much better seen *for the first time* by the aid of a twenty-fifth, for example, magnifying twelve hundred diameters with the lowest eye-piece, than with a quarter or eighth so combined with powerful eye-pieces as to yield a similar amplification; such at least is the result of my experience in hundreds of trials, and I feel confident that additional benefit will often be derived from the use of a fiftieth, which I have just procured from Messrs. Powell & Lealand, as, for instance, in the diagnosis of white blood corpuscles from the nuclei of renal epithelium, and in the detection of those very minute oil globules which mark the earliest stage of fatty degeneration in the cells of the uriniferous tubules.

Since any consideration of the diagnostic values possessed by other constituents of the urine in Bright's disease does not fall within the scope of my present paper, as stated above, I propose to dismiss the forms of

albuminuria in which the chief or important lesions are fatty, amyloid or granular degeneration, and confine myself to the consideration of those pathological states where red and white blood cells appear in the urine, and can be regarded as indicative of some renal affection. It is obvious that vesical or urethral irritation may at any time cause the urine to exhibit most of the chemical reactions and microscopic appearances found in Bright's disease, and cases doubtless occur in which it is impossible to distinguish at a first sight whether the blood elements are effused in the bladder or kidney, yet by a careful investigation, not only of the local and general symptoms, but also of the history of the patient, correct conclusions may generally be obtained. In the following instance it seemed, however, impossible to determine the seat of the malady until a second examination disclosed the existence of tube casts:—

CASE I.—Mr. J. L., æt. 50, consulted his family physician on the 26th of September, 1869, on account of the condition of his urine, as he supposed he was passing blood. Careful investigation failed to reveal any constitutional or local symptoms of disease except slight pain in the loins, a little uneasiness in passing water, and some diminution in the amount of fluid voided during twenty-four hours; no exciting cause of the seizure could be discovered, nor was there present any diathesis hereditary or acquired which might be considered as a predisposing agent. Four fluid-ounces of his urine passed the next morning were of a bright red colour, and on standing let fall a dense pinkish deposit which occupied about f3iij of the liquid; under the microscope this sediment was found to be composed chiefly of red and white corpuscles in the estimated proportion of fifty of the former to one of the latter: there were also numerous epithelial cells chiefly vesical, many of which were deeply stained with hæmatin. A specimen of next day's urine, after he had been cupped on the loins, was much lighter in colour, and on microscopic examination was found to deposit but about one-twentieth the amount of corpuscular blood elements existing in the water passed the day previous, although the coagulum produced by heat and nitric acid was at least one-fourth as bulky; thus indicating that the albumen did not proceed solely from effused blood. The sediment also contained a large amount of oxalate of lime, and on examining the fourth of a square inch of urinous film one well-marked cast inclosing white blood cells and several doubtful aggregations of matter resembling tube casts were discovered. A specimen of the urine brought to me on the 22d of October was found to be normal in colour and appearance, specific gravity 1020, neutral in reaction, and when tested with heat and nitric acid still showed a notable amount of albumen, the coagulum not exceeding, however, one-twelfth of the fluid boiled. Three ounces allowed to stand undisturbed in a conical glass deposited nearly f3ij of light cloud-like sediment, which under the microscope showed a very few oxalate of lime crystals, about on an average twenty blood corpuscles, of which four were white globules, to each field, and in one-fourth of a square inch of urinous film two well-marked faintly granular casts. At the date of this last examination the patient showed no obvious symptom of disease, and reported that he had enjoyed fair health through the interval and passed no more blood.

Among the means of distinguishing when the effused blood is of vesical and when of renal origin, it is to be noticed that the seat of pain or soreness on pressure is one of the most important; of less general application, although of course more positive when it occurs, is the existence of tube casts in the urine, which, when indubitable, prove, I believe, that we have to deal with nephritis. Care must, however, be taken to avoid confounding accidental aggregations of matter with genuine casts from the uriniferous tubules, for I have seen at least a thousand pseudocasts, and excellent imitations too, that were produced in an instant by a slight sliding movement of the thin glass cover. It is not, I believe, common to meet with more than two or three specimens of the rounded epithelium from the uriniferous tubules upon a single slide, unless desquamative nephritis exists, and should the cells exhibit distinct oil globules, even although not more than $\frac{1}{30000}$ of an inch in diameter, great force would be added to the presumption of Bright's disease, derived from the presence of the blood elements associated with renal epithelium. It is also, I think, rare for us to detect the amœboid movement, and unusual to find even the irregular shape which precedes the complete death of the motionless leucocyte in pus (white blood) corpuscles from the kidney, while this motion may often be observed in the urine of cystitis, especially if examined while fresh and without being allowed to cool below the normal temperature of the body. As mentioned by Prof. Beale, phosphatic crystals seldom occur with pus-cells from the kidney, a useful aid to diagnosis when we are able to exclude suspicion of coexisting trouble about the bladder. Of course the detection of tube-casts with red and white corpuscles imbedded in their substance is a positive index of Bright's disease.

Supposing now that by the assistance of any or all of these indications we have been able to eliminate vesical irritation as a cause of the presence of blood-elements in the urine, it remains to be seen how far the actual number and relative proportion of the red and white corpuscles serve to point out the past, present, and future of the renal affection.

First. When the red blood globules very largely exceed the white in number, approximating to the proportion in normal blood, it is probable, as intimated above, that rupture of some small vessels has taken place, and the flow of blood is a true hemorrhage from the kidney, which may be produced by blows across the loins or lacerations caused by angular calculi. This opinion will be further strengthened if a thorough search fails to reveal any tube-casts, and if the albumen as coagulated by heat and nitric acid is no more than should exist in an amount of liquor sanguinis corresponding to the bulk of deposit formed of cell walls from the red disks.¹ As an approximative guide for determining this last point, I find by experiment that a fluidrachm of blood stirred up in two fluid-

¹ See my paper in the Am. Journal of the Med. Sciences, July, 1869, p. 53.

ounces of water lets fall, on standing twelve hours, a whitish deposit of fibrin and cell-walls, measuring about two fluidrachms, and that a portion of the supernatant liquid tested with heat and nitric acid yields a coagulum, chiefly albuminous, occupying about one-fourth of its bulk.

In the following example the irritation appears to have been mechanical, but no evidence of resulting nephritis could be detected.

CASE II.—E. R., gentleman, *æt.* 60, consulted his medical adviser in the early part of June, 1869, on account of a dull pain in the region of the right kidney; he had also been troubled with a little dyspepsia and a slight tendency to diarrhœa, but had not been exposed to cold, or suffered any strain or blow in the dorsal region. There was no pain in the bladder, no history of gravel, and no perceptible gouty diathesis, although his father had been the subject of some renal irritation in advanced life. He had no headache, no œdema of the face or ankles, and the very faint febrile movement seemed obviously due, with the slight diarrhœa, to a little gastro-intestinal catarrh. The urine, which was quite dark in colour, was found to be acid; specific gravity 1021; free from sugar but yielding a slight cloud on the application of heat, which, as it did not wholly disappear after nitric acid was added, doubtless indicated the presence of albumen. On placing a drop of the urine from the bottom of the glass beneath a microscope, the deposit was found to consist of small crystals of oxalate of lime, and red and white corpuscles, the former generally quite decolourized. As the blood-elements bore to each other almost their normal proportions, it seemed probable that they proceeded from some abrasions or other solutions of continuity caused by small angular renal calculi rather than from an exudation through the walls of the vessels, an opinion almost substantiated by the subsequent history of the patient, who rapidly convalesced under suitable treatment for the oxaluria, and when last heard from, four months later, was in excellent health.

Second. When in Bright's disease the white blood corpuscles are mingled with red disks in a proportion exceeding one twenty-fifth of the latter, my observations lead me to conclude that generally the patient is suffering from an acute or subacute inflammation of one or both kidneys, and attended with danger therefrom more or less serious, according as the amount of corpuscular elements shows by its absolute quantity that a larger or smaller portion of the kidney is inflamed. If the albuminous coagulum produced by heat and nitric acid occupies more than one-half the fluid tested, and many times exceeds that which would be furnished by the liquor sanguinis corresponding to the blood corpuscles, an extensive inflammatory disease probably exists, unless careful microscopic scrutiny shows decided fatty degeneration (and consequent loss of secretive power) in the epithelium of the uriniferous tubules. The following case, for whose complete history I am indebted to the note-book of my friend George Pepper, M. D., illustrates some of the views above enunciated.

CASE III.—G. M., wheelwright, *æt.* 43, married, and father of four healthy children, was admitted into the men's medical ward of the Pennsylvania Hospital, 12th August, 1869, under the care of Dr. J. Forsythe

Meigs, to whose courtesy I owe permission to make use of this report. The patient stated that he came of a long-lived family, and had always enjoyed good health; that he had been in America about eleven months, and had a stormy passage out, during which he was somewhat exposed. His habits have been moderately temperate, and he has never had any venereal disease. Fifteen years ago he injured his hand, losing the third and little fingers, but the wound was carefully treated, healing up within thirty days, and without extensive suppuration. For several years past he has always been obliged to rise once or twice during the night to urinate, but the water has never been smoky or bloody; during this period he has noticed a slight puffiness of the ankles after long walks or prolonged standing. About two months before admission his feet first began to swell, at which time he appeared to be in his usual health, and had no new symptoms, but soon after he had an attack of profuse diarrhoea, unaccompanied by backache, pain in the bladder, enlargement of the abdomen, or puffiness of the eyelids, and not severe enough to confine him to bed, even for a day, or prevent him from working as usual. From that time the dropsy gradually increased, invading the legs, thighs, scrotum, and abdomen, until about two weeks before his entrance into the hospital, the skin of his legs cracked open in several places, and a profuse discharge of serum occurred. On admission, his complexion was pale and waxy; his legs were enormously swollen (the calf measuring $18\frac{3}{4}$ inches in circumference), fissured, and the skin covered with chronic eczema; a slight squamous eruption, bran-like in appearance, also affected the face, neck, and upper portion of the thorax. There were no abnormal heart sounds, cough, or dyspnoea; bowels rather loose, although at times regular; appetite good, and tongue clean but pale. He passed water frequently and in great abundance, which, on examination by the resident physician, was found to be light coloured, slightly acid in reaction, and on being tested with heat and nitric acid, to yield about one-eighth of its bulk of albuminous coagulum. On the 16th of August, when his general condition was much the same, although the swelling of his legs had diminished, and the eczema had disappeared, he passed seventy ounces of light-coloured urine, of the specific gravity of 1018, and still containing a large amount of albumen. Of this urine I obtained a specimen for the first time, and on examining the rather abundant deposit which it let fall, I found it to be composed of white and red blood corpuscles, in proportion of one to five, a few darkly granular, faintly granular, and pale hyaline casts, and numerous elongated masses, composed chiefly of epithelial cells, which appeared to have undergone a remarkably equal fatty degeneration. These latter casts did not soon become tinted with aniline, as ordinary fibrinous and hyaline casts, although not germinal matter, readily do. On the 1st of October his condition was decidedly improved; he had gained flesh and colour, had a good appetite, and slept soundly at night. He had then no dropsy, but the urine continued abundant, amounting to eighty fluidounces in twenty-four hours, and still obliging him to rise in the night to micturate at least once and sometimes twice; heat and nitric acid continued to throw down a bulky coagulum of albumen. On the 15th of October a specimen of urine, of which he passed ninety-six ounces in a day and night, was examined carefully as above described, when it was found that one-fourth of a square inch of urinous film from the three fluidrachms of light cloudy deposit let fall by four fluidounces standing twelve hours, contained twenty-eight pale granular casts, some inclosing epithelial cells, white blood cor-

puscles, and red disks; one of these casts, about $\frac{1}{40}$ of an inch long and $\frac{1}{800}$ of an inch in diameter, faintly granular in character, had imbedded in it two white blood corpuscles, five red ditto, and one epithelial cell. Numerous red and white blood globules floated freely on the slide, in the proportion of about one white to twelve red, the latter averaging five to each field. Under a power of 1200, the generally hyaline casts were seen to have small particles of granular matter resembling oil globules deposited upon their surfaces. The epithelial cells were only slightly fatty, the particles of oil not exceeding $\frac{1}{25000}$ of an inch in diameter. By the careful addition of aniline dye at the margin of the cover the large single nucleus of each epithelial cell, the one, two, or three nuclei of the white blood corpuscles, and the delicate membranous (or membranoid) wall of the red blood disks were brought out in a distinct and beautiful manner, dissipating in this instance, all difficulty in diagnosing, each from the other. The coagulum produced in this urine by the application of heat and nitric acid, and also by heat alone, was still quite abundant, occupying fully one-fourth of the fluid tested; but in spite of this constant drain upon his system, the patient, under the influence of judicious treatment, nutritious food, and the excellent sanitary condition of the hospital, continued to gain flesh and strength, and on the 22d of October had wonderfully improved in general appearance.

CASE IV.—Exemplifies that frequent occurrence in the course of Bright's disease, an acute attack supervening upon one of the chronic forms, as follows:—

Ellen G., cloak-maker, æt. 29, unmarried, was admitted into the Women's Medical Ward of the Pennsylvania Hospital, May 2d, 1869, during the service of Prof. J. Aitken Meigs, who has kindly permitted me to report the case. The patient stated that her father died of consumption twenty-six years before, and her brother of dropsy in his twenty-second year. She had worked very hard at her trade for the last ten years, sometimes as much as fifteen hours daily, and during that time, nearly eight years since, had a severe attack of yellow fever, subsequent to which she had suffered much from dyspepsia, and been troubled occasionally with eruptions upon the face. About five weeks before admission she took a very severe cold, after exposure to wet, which was followed by a sense of weakness in the loins that gradually developed into a sharp pain in the lumbar and abdominal regions; nausea and vomiting, loss of appetite and intense thirst came on about the same time. One week later she first noticed puffiness of the eyelids; and a few days afterwards enlargement of the abdomen and œdema of the feet and legs came on. Shortly after taking cold she noticed that she was obliged to rise three or four times in the night to pass water, also that the fluid when voided was dusky, and deposited, on standing, a sediment that looked like coffee grounds. For the week following her exposure she had a troublesome diarrhœa, but since then her bowels have been regular, although severe griping pains in the abdomen still persisted. Throughout the week previous to admission she had been troubled with roaring noises in her head, but she did not suffer much from headache, and her intellect was quite clear. On entering the hospital her face, feet, limbs, and abdomen were all very œdematous, and her countenance presented the pale, waxy hue of Bright's disease in a very marked degree. A specimen of her urine examined on the 24th of May was of a dark reddish-brown colour, specific gravity 1010, and con-

tained about one-third of its bulk of albumen as coagulated by heat and nitric acid. Under the microscope I found the abundant deposit let fall on standing was composed of large numbers of red and white blood corpuscles in the estimated proportion of twenty-five to one, much granular debris, and some well-defined casts, granular, fatty and fibrinous, all more or less stained with the hematin from the decolourized red globules; some of the tube casts had imbedded in their substance epithelial cells which had undergone marked fatty degeneration, many of the oil globules measuring $\frac{1}{100000}$ of an inch in diameter. Under the influence of appropriate saline diuretics the flow of urine rapidly increased, and five days after the above examination was made the amount passed in the preceding twenty-four hours measured 112 fluidounces, which free diuresis soon produced a very satisfactory decrease in the anasarca and ascites, but I was unfortunately prevented by illness from making further examination of this patient, and can only add that she was discharged from the hospital on the 7th of August very much relieved.

The next instance is one in which the slight local nephritis of short duration appeared to be traumatic.

CASE V.—N. C. D., merchant, while apparently in usual good health, was attacked suddenly after breakfast on the 20th of September, 1869, with intense pain in the region of the left kidney, extending downward toward the groin. A specimen of his urine, examined on the 26th, was found to contain many uric acid crystals, numerous red and white blood-corpuscles in nearly equal proportions, and in half a square inch of urinous film three casts of the uriniferous tubules, having white blood globules and epithelial cells imbedded in their substance. The amount of albumen appeared to be but little more than that proportionate to the blood corpuscles, so that it was deemed probable that an angular calculus of uric acid had suddenly changed its place in the kidney, become impacted and set up a local nephritis confined to the small portion of renal structure in its immediate neighbourhood. The pain in the loins returned at intervals for some days, gradually becoming less severe, and under alkaline treatment passed off in about two weeks from the first attack, leaving the patient in good health, which he has enjoyed up to the present date (Oct. 22d, 1869).

Lastly, should we discover on examination that the white blood cells (hitherto designated as "mucous corpuscles," "exudation corpuscles," and by Dr. Beale "cells closely resembling pus corpuscles."—*Microscope in Practical Medicine*, p. 219) pass off from the kidneys with little or no admixture of the red disks, we may conclude that a chronic inflammation of the organs exists less or more extensive as the number of the leucocytes is smaller or greater and as the amount of fatty degeneration, estimated as above suggested, is serious or otherwise; for my researches tend to show that the one cause of albumen in the urine varies inversely as the other; that is, if in a given case of Bright's disease the urine containing say one-fourth of its bulk of coagulated albumen after boiling, shows many white blood corpuscles with epithelial cells only slightly fatty; and another specimen of the same, collected perhaps two months afterwards, exhibits with the same amount of albumen few leucocytes but epithelium containing

large oil globules, we may conclude that (following Dr. Grainger Stewart in his classification on the basis of Virchow's), we have to deal with the First or Inflammatory form (involving a large portion of the organs), which has passed from stage *a*, that of Inflammation, to stage *b*, that of Fatty Transformation; many cases, however, seem to run a much more favourable course, the pus corpuscles diminishing in number without any corresponding advance towards fatty degeneration in the epithelial lining of the tubules, so that the albumen slowly decreases in quantity, and the patient regains at least a comfortable state of health, as in the following example.

CASE VI.—X. Y., merchant, native of Philadelphia, but for some time past residing in one of the New England States, came under my observation August 8th, 1869. From his family medical attendant I learned that about six weeks before he had been exposed to cold and wet, which, acting upon a constitution enfeebled by the poisonous effect of lead and various other causes not necessary to mention here, had resulted in an ill-defined febrile attack, attended with pain in the back, and high-coloured urine; but that unfortunately from the fact of the physician himself being at the time an invalid, no examination of the renal secretion was then made. During the first week in August he was seen in consultation by Prof. Alonzo Clark, of New York, who, on testing the urine, discovered, as I was informed, a notable amount of albumen and several delicate hyaline casts of the uriniferous tubules. My first examination of the morning urine, made during the evening of August 9th, with the precaution above described, showed in three-quarters of a square inch of urinous film twenty-five or thirty epithelial cells, some of which inclosed very minute oil globules, about an equal number of free white corpuscles, and some exceedingly delicate hyaline casts, two of which contained one or more leucocytes; no red blood globules were detected; on testing with heat and nitric acid only a moderate opalescence of the liquid was produced, but this trace was deposited next day into a thin film upon the bottom of the tube, which proved entirely amorphous under the microscope. Frequent examinations of the urine from this patient were made with similar results, except that the amount of albumen gradually decreased until on the 27th of August my note-book states that the urine was clear and normal in both colour and quantity, and on testing with nitric acid not the slightest cloud was visible, nor was any produced by long boiling of the acidulated liquid. Four fluidounces set aside in a conical glass for two hours let fall a scanty flocculent deposit which, under the microscope, was seen to be composed chiefly of epithelial cells and white blood corpuscles, but also contained a few very delicate hyaline casts. Three-quarters of a square inch of urinous film when carefully examined showed three transparent casts, one of which contained four white blood cells (pus corpuscles). On the 10th of September the urine was found free from all trace of albumen, and in half a square inch of urinous film could only discover two hyaline casts, the longer containing two epithelial cells apparently healthy, and three leucocytes, the shorter no epithelium, and but one white blood corpuscle.¹

¹ Although the urine remained clear when boiled, after acidulation with nitric acid it gave a slight cloud with the delicate carbolic acid test of M. Mehu (*Ar-*

Except during the first two weeks after I began to investigate his case, this patient had no symptom of renal disease, save the constant, although scanty deposit of casts, white blood corpuscles, and epithelial cells let fall every day by the urine, and although suffering from other effects of lead which complicated his case, the kidneys on the 20th of October, when I last heard from him, appeared to have become gradually restored, if not to health, at least to a condition in which they were capable of performing their normal functions.

It is probably in regard to cases such as this that Dr. Beale remarks (*Kidney Diseases and Urinary Deposits*, 1869, p. 344): "Casts containing pus are not common, although some cells agreeing in many characters with the pus globule are not uncommonly present. Of these cells some are no doubt modified cells of renal epithelium, the germinal matter of which is of much larger size than in health, the formed matter of the cell being nearly absent, while others are altered white blood corpuscles (pl. xvii., figs. 93, 94). . . . I have, however, seen many cases in children and adults, where these casts and cells were most abundant, which have been completely recovered." The "altered and growing white blood corpuscles" figured on "pl. xvii." are, I opine, accurate delineations of white blood globules which have become distended by immersion into urine or other fluid of low specific gravity, as described in the early part of this paper, of which it seems to me any one can satisfy himself in a few minutes by simply repeating my experiments.

Recapitulating now the conclusions above reached, it will be seen that while red and white corpuscles occurring as described in the urine, in their normal proportion point to renal hemorrhage, and the same elements when more nearly equal in number indicate an acute or subacute nephritis, the existence of white blood cells (pus, mucous, or exudation corpuscles) *generally* shows a chronic or, at least, less active inflammatory condition of the kidneys: further, that a series of comparative examinations performed with the precautions above-detailed at intervals of a few days affords an important guide to the effect of treatment, and to the progress of the disease; and, therefore, it may be, I think, safely asserted that due regard being paid to the general symptoms and the occurrence of albumen and tube casts in Bright's disease, we can by a careful study of the corpuscular blood elements, as seen in the urine, diagnosticate the form and stage of the renal affection with much more accuracy than it has heretofore been customary to do.

chives Générales de Médecine, Mars, 1869), but not being as yet familiar with the fallacies, if any, to which conclusions deduced from the action of this reagent are liable, I merely note the fact as it occurred, intending to make some future investigations in regard to its value.

ART. V.—*Observations on the Treatment of Certain Complications of Hooping-Cough by Means of the Oil of Turpentine.* By BEDFORD BROWN, M. D., of Alexandria, Va.

PROBABLY no other drug exerts so prompt and universal an influence over the entire secernent system of membranes, as sudorific, diuretic, expectorant, and alterative, as the oil of turpentine. These peculiar powers of the remedy render its action particularly applicable to the treatment of the grave forms of hooping-cough, the more dangerous complications of which affection are, with the exceptions of pneumonia and inflammation of the cerebral substance, generally confined to the mucous surfaces or serous membranes of the brain.

It will be found that torpidity of the renal functions is a marked and important feature of all the more serious forms of this affection. The action of the turpentine, under these circumstances, is that of a decided but safe diuretic, often producing a copious flow of limpid urine to the manifest relief of the general symptoms, whether febrile or irritative.

On the morbid states of the bronchial mucous membrane in hooping-cough, the remedial influence of the turpentine is that of a soothing, but active expectorant, reducing inflammatory action, tranquillizing irritation, and diminishing copious and exhausting discharges.

Over the varied irritations and inflammations of the vast mucous tract of the alimentary canal, which accompany hooping-cough so tenaciously during the hot and malarious seasons, the action of the oil of turpentine is the most permanent in its corrective influence of any other agent in the knowledge of the writer.

The morbid complications of this affection to which the turpentine treatment is more particularly adapted are infantile remittent or gastric fever, a peculiar irritative form of continued fever, bronchitis, hæmoptysis, convulsions, dysentery, and enteritis.

Infantile Remittent Fever.—During the prevalence of hooping-cough, particularly in the hot season, in many cases, an irritation or inflammation of the alimentary mucous membrane is exceedingly liable to arise, attended with sero-bilious or mucous discharges, which at certain stages of such cases passes into a train of constitutional derangements characterized by excessive tympanitis, fever of a low remittent type, exhausting perspirations during the remission, general prostration, muttering delirium, singultus, loaded tongue, and scanty urine. In relieving this train of symptoms the oil of turpentine has proven decidedly efficient.

Bronchial Affections.—In the advanced stages of certain cases of hooping-cough, a subacute form of bronchial inflammation occurs of an exceedingly obstinate character, attended with very copious bronchorrhœal dis-

charge, remittent fever, emaciation, and nocturnal perspirations, frequently so free as to resemble those of hectic fever. The mucous discharge in these cases is so excessive as to endanger the lives of the very young and feeble by sudden asphyxia, while in others the exhaustive process is gradual but progressive. In this class of cases bronchial dilatation, emphysema, and permanent thickening of the mucous membrane are found. For relieving this most obstinate form of bronchial affection, the steady and persevering use of the oil of turpentine has never failed in my own hands.

Continued Form of Irritative Fever.—In malignant epidemics of whooping cough this form of fever is not unfrequently met with. Its leading characteristics are, continued fever, temperature ranging from 102° to 107° , with but little diurnal variations, progressive and great emaciation, an unvarying dry and husky skin, suspension of the bronchial secretions, frequent pulse, constant and busy delirium, constipation, retraction of abdominal walls, inordinate erethism of the nervous system, vigilance, dry and glazed tongue, and scanty urine. This is not the enteric fever of Louis, for it is wanting in its specific local lesion. Neither is it dependent on local inflammatory action, but apparently is due to the poisonous influence of the peculiar infection of pertussis aided by epidemic influences. In restoring the secretions, and relieving the febrile and nervous excitement, the oil of turpentine here, as in the preceding instances, has been efficient.

Hæmoptysis.—Hæmoptysis, if not associated with tubercle, can usually be controlled by the turpentine treatment.

Cerebral Complications.—In congestive and inflammatory affections of the brain the condition of the renal functions will usually be found torpid, occasionally nearly suppressed here as in other instances. To relieve this difficulty the turpentine is the most active agent. When given in these affections in combination with the bromide and iodide of potassium in quantities sufficient to produce decided stimulus to the urinary functions, it constitutes the most successful treatment with which the writer is acquainted. Finally the turpentine may, under certain circumstances, be combined with cathartics, other diuretics, mineral or vegetable, expectorants, or sedatives, with advantage, according to the particular requirements of the case.

ART. VI.—*Femoral Aneurism in the Groin successfully treated by Flexion of the Limb, after a Relapse following a previous Apparent Cure by Compression.* By GURDON BUCK, M. D., Surgeon to New York Hospital and St. Luke's Hospital, etc. (Read at the meeting of the Medical Society of the County of New York, Oct. 1869.)

E. W., policeman, æt. 30, native of Ireland; healthy constitution, temperate habits, was admitted into the New York Hospital June 24th, 1867. He stated that about five months ago he first experienced a burning sen-

sation in the right groin after standing four or five hours, which, however, subsided on resting awhile. A physician whom he consulted attributed it to an enlarged gland, and prescribed tincture of iodine and plasters. No benefit followed. On the contrary, the burning sensation slowly and gradually increased, and about two weeks ago he first noticed a pulsating tumour in the groin. The burning sensation became worse at night after a hard day's work. Patient can assign no cause for his ailment. The aneurismal tumour of the size of the butt end half of a hen's egg, is situated over the femoral artery, immediately below Poupart's ligament, pulsates distinctly with a well characterized souffle, and can be obliterated by direct digital compression. Pressure upon the external iliac artery above requires to be made with very considerable force in order to arrest pulsation in the tumour, owing chiefly to the fulness and prominence of the abdominal parietes. In consideration of the moderate size of the tumour, and its recent origin, as well as the healthy condition of the patient, it was decided to employ indirect compression for the treatment of the aneurism. While an instrument was being constructed with which to carry out this plan of treatment, the patient was directed to keep in bed, and apply digital compression three times in 24 hours for 10 or 15 minutes at a time. An instrument constructed after the plan of Dr. Tufnell was tried on the 14th July, but was found inapplicable. In the meantime Dr. C. M. Bell, house surgeon, had devised and prepared an ingenious apparatus, consisting essentially of an elastic steel band two inches wide, bent in a circular form to pass around the body, and well padded behind to bear the counter pressure. In front the ends were joined to a flat bar of iron 18 inches in length, with a slit along its middle. In this slit a rod standing vertically with a compressing pad at one end, was made to move from side to side, and could be adjusted so as to make compression at any desired point. Without further description, it is sufficient to say that this apparatus could be adjusted so as to compress the iliac artery above Poupart's ligament, and arrest pulsation entirely in the aneurism.

On the 16th July at 4 P. M., the above described instrument was applied, and the treatment by compression commenced. From its first application pulsation was arrested in the tumour and in the posterior tibial artery. The temperature of the limb became lower than that of its fellow, and patient complained of pain in the small of his back and numbness of his right leg. The limb was elevated, and a single grain pill of opium ordered every two hours. At 5 o'clock no pulsation in the tumour is perceptible; patient is uneasy and moves restlessly from side to side; limb is icy cold and of a somewhat dusky hue, especially the toes. Ordered the limb wrapped in flannels, and bottles of hot water to the feet.

July 17. Slept little last night, but was comparatively free from pain; took during the night two pills of opium, and had two hypodermic injections of sol. sulph. morph., gtt. x each.

Tumour is without pulsation, feels hard and resisting, and appears diminished in volume. Still complains of numbness of leg and pain in the back, but of none from the pad. The temperature of the limb has risen, though a decided difference between the two limbs still exists. Omit opiates during the day.

18th. Resumed opiates last night. Tumour hard and more distinctly circumscribed. A small pulsating artery is felt running over the surface of the tumour. Limb warmer though not as warm as the other. At 4 o'clock P. M. no pulsation in the tumour. Forty-eight hours having

elapsed since the application of the instrument, the pressure was now reduced one-half.

19th. Removed the instrument entirely. Still no pulsation; the outline of the tumour can be distinctly defined; it occupies the outer and anterior aspect of the femoral artery. Right limb is a little larger than its fellow, and its temperature still a little lower. Two or three blisters have appeared upon the surface where the compressing pad rested, and several along below the crest of the ilium on both sides where the apparatus chafed the surface.

20th. No pulsation in the femoral low down or in posterior tibial artery.

Aug. 28. Sloughing of the skin has taken place where the pad rested, and below the crest of the ilium on both sides, where the instrument chafed. The ulcers consequent upon the sloughing are healing; patient is up and about the ward.

Sept. 12. The ulcers all healed. Patient going about and uses his limb almost as well as ever; the aneurismal tumour, further reduced in size, is of the volume of a marble. No pulsation can be felt in the posterior tibial artery. The right limb remains a little larger than its fellow; its temperature is about normal. Discharged cured.

Relapse cured by Flexion.—The patient was readmitted to the hospital Jan. 14th, 1869, with a return of the aneurism, and stated that since he left the hospital sixteen months ago he has enjoyed uninterrupted good health and pursued his accustomed avocations. Has had no trouble from his limb till within a few weeks, except last summer, when the vessels around the knee became swollen and varicose but unattended with pain, except after long walking. The use of an elastic knee-cap relieved this condition. About eight weeks ago he noticed a peculiar burning sensation in the right groin, at first only felt in the erect position and in walking for a length of time; it was relieved, however, after resting. In the morning and while in the recumbent position it was entirely absent. Accompanying this burning sensation he discovered a feeble pulsation, at first very slight, but gradually increasing. Apprehending a relapse of his former trouble, he retired from police duty and remained at home, spending most of his time in a recumbent position by way of precaution. His general health in all other respects continued good. Three weeks ago he first became aware of the existence of a swelling in the right groin, which he could distinguish by the touch, in the situation of the former aneurismal tumour. It gradually increased till it attained its present condition, and became visible upon the surface. It is situated as before, over the femoral artery immediately below Poupart's ligament, rises visibly above the surface, and is equivalent in volume to the butt end half of a hen's egg. It is soft and can be easily obliterated by digital compression. It pulsates with a distinct aneurismal souffle. Deep digital pressure immediately below the tumour arrests the pulsation, but the firmer pressure above the tumour makes no impression, nor can the pulsation of the iliac artery itself be distinguished at this point. By flexing the thigh upon the trunk to its extremest degree, pulsation in the tumour was found to be temporarily arrested, a less degree of flexion reduces the force of the pulsation, and at the same time softens and diminishes the plumpness of the tumour, causing it partially to collapse. No œdema or other swelling is observable in the limb. The effect of flexure upon the tumour thus ascertained, suggested the mode of treatment which was decided upon, and was instituted as follows: Over the patient lying in bed upon his back, a

frame was arranged, from which two bands of canvas four inches broad suspended in loops, were made to support the leg flexed upon the thigh, the thigh itself being also flexed upon the trunk. This arrangement proved extremely irksome by confining the patient to one position upon his back, and had to be abandoned after twenty-four hours' trial. The patient himself being intelligent and willing to co-operate in carrying out any plan of treatment, the following arrangement was substituted. A broad bandage was applied, embracing the lower part of the trunk and the thigh close to the knee, so as to maintain flexion and allow the patient to vary his position at pleasure. He was enjoined also to increase the flexion of the thigh to its utmost degree, and maintain it as long at a time and as often as he could endure it. This method was put in operation on the 15th January, and continued without interruption.

Jan. 21. On careful examination, the limb being extended, the tumour was found to have diminished in size, and become firm and no longer to be capable of obliteration. Its most prominent part was more yielding under pressure than elsewhere; pulsation was feeble, and a faint souffle only perceptible.

Feb. 1. A gradually progressive improvement has taken place. The tumour is still further diminished in size, and the pulsation abated in force. The souffle is only feebly perceptible. The bandage is removed and patient allowed liberty of position, but still required to remain in bed.

4th. Patient is allowed to be out of bed, but not to walk about.

6th. The improved condition of the aneurismal tumour being sustained, the patient is allowed to go about the premises.

17th. The tumour is scarcely perceptible on the surface; it is firm and unyielding. From the commencement of the treatment a process of consolidation appears to have been gradually and progressively taking place in the tumour, affording every indication of a permanent cure; patient was to-day discharged to return to his home, and was enjoined to live quietly and exercise moderately, to be observant of the progress of the tumour in the groin, and report himself for observation from time to time.

Sept. 10, 1869. Patient's condition this day is as follows: The tumour in the right groin is no longer visible upon the surface; it has shrunk to a flattened, hard mass, less than half its original size. All abnormal sound has disappeared; a feeble pulsation which the patient thinks he feels may be communicated to the tumour by the subjacent artery. After a long walk he still has some remains of the former burning sensation in the groin, which, however, disappears on resting.

Oct. 18. Patient was presented for observation at a meeting of the County Medical Society. For a fortnight past he is confident there has been no pulsation in the tumour. In other respects his condition is as above reported.

Remarks.—The successful employment of flexion in the treatment of aneurism is of quite recent origin. In September, 1858, Dr. Theodore Maunoir, of Geneva, Switzerland, reported a case in the *L'Echo Médicale*, of Neuchatel, treated by himself in June of 1857. In examining his patient with popliteal aneurism, Dr. M. ascertained that flexion of the leg upon the thigh arrested pulsation in the tumour. He thereupon endeavoured to cure the tumour by maintaining permanent flexion of the limb, for which

purpose he first had made a sort of laced cap, which his patient was unable to endure. He then substituted a sort of sling which passed from the shoulders and supported the leg in a flexed position. After wearing this for about twenty days, his patient finding that the tumour had diminished in size, laid it aside and disappeared from notice. One year after Dr. M. had an opportunity of examining the patient, and found the tumour reduced to the size of a pigeon's egg, hard, free from pulsation, and to all appearance permanently cured.

In April, 1859, Mr. Ernest Hart, Surgeon of St. Mary's Hospital, London, reported before the Royal Medical and Chirurgical Society, a case of popliteal aneurism successfully treated by flexion, in 1858, and published it in the 42d volume of the Society's *Transactions*. On the 28th of January, 1862, Mr. Hart reported before the same society other successful cases treated by himself and other surgeons. On the same occasion, Mr. A. Shaw communicated a successful case of popliteal aneurism treated by flexion. The whole number of cases amounted to nine, of which eight were popliteal aneurisms, and one a traumatic aneurism of the radial artery. A few other cases, all popliteal aneurisms, are met with in succeeding volumes of the *London Lancet* and *Medical Times and Gazette*. This method is, from the nature of the case, restricted in its application to the treatment of aneurisms of the extremities, situated at the flexures of the joints. According to Lefort, *Dict. Encyclopédique des Sc. Med.*, Art. Anévrisme, p. 602, Paris, 1866—"Up to the present time, flexion has only been employed successfully in the treatment of popliteal aneurism, and aneurism in the fold of the elbow." Our case may, therefore, claim a place in the records of surgical science as a new achievement of this new method. In regard to the *modus operandi* of flexion we may suppose that it acts first by direct compression of the aneurismal tumour itself, and second by indirect compression of the artery on the cardiac side of the tumour through the medium of the tumour itself: chiefly, however, by the indirect compression of the artery, which either retards or completely intercepts the current of blood going to the sac, according to the degree of flexion maintained. In the case herein reported, pulsation in the tumour could only be completely arrested by the extremest degree of flexion, and that could only be tolerated for a very short time. It was, therefore, mainly by diminishing the flow in the sac that the deposition of laminar fibrinous clots was promoted, and a permanent obliteration of the sac ultimately effected. The complete arrest of pulsation during the treatment could only have been intermittent in this case, and that only for a short time at once; it being left to the discretion of the patient to urge the flexion to its utmost point, as he was able to endure it. Though restricted in its application, this method is certainly entitled to be regarded as a valuable addition to our resources in the treatment of this formidable disease, especially as it is unattended with the dangers incident to the

treatment by ligature, and as it is shorter in its duration, and accompanied generally with much less pain in its employment than the treatment by indirect compression. Within its own sphere it ought always to have a first trial, inasmuch as it can never, though found inapplicable, prevent a resort to other methods. We may further remark some interesting points in the antecedent history of this case prior to its treatment by flexion.

The relapse of an aneurism after its apparent cure by the ligature, is not a very rare occurrence; it is much rarer, however, after treatment by compression. In both cases the relapse is to be attributed to the fact that the clot filling the aneurismal sac after the occlusion of the artery, fails to undergo a transformation into fibrinous clots, by which alone a permanent obliteration of the aneurism can be effected. Sooner or later the circulation re-established through collateral channels disintegrates the soft clot and the aneurism is reproduced. That a relapse should take place after treatment by compression is to be attributed to the immediate and complete occlusion of the artery by the too firm application of the compressing pad at the outset of the treatment, the effect of which is to produce the same condition in the aneurismal sac as follows the application of the ligature. In both cases instantaneous arrest of circulation in the sac is followed by the formation of soft clots, and in both cases the same liability to relapse ensues. This explanation holds true in the case now under consideration. The compressing apparatus, it will be remembered, arrested pulsation in the tumour from the moment of its application up to the time of its removal. It is, however, a remarkable exception to the common rule, that so long an interval as fourteen months should have elapsed after its apparent cure before the reproduction of the aneurism.

ART. VII.—*Permanganate of Potassa in the Treatment of Certain Female Diseases.* By A. M. WILLIAMS, A. M., M. D., of Springboro', Crawford County, Pa.

I DESIRE to call attention to certain uses of permanganate of potash, which, so far as I am aware, have not been alluded to by writers. This salt has of late received favourable notice in the journals, and is certainly one of the most valuable articles of the materia medica to the surgeon. From my own experience I am led to believe that it may likewise be made of great value to the obstetrician and gynecologist. The cases in which I have found it most useful have been those of *excessive purulent and prolonged lochial discharge*.

A year ago I was called to see a woman who had been confined about two weeks previous to my visit. She was a primipara, small, and of strumous

constitution. The person who attended her during labour was a homœopathist. The labour seems to have been an easy one; the lochia was more than usually abundant, and on the fifth or sixth day it became purulent and highly offensive, growing more so continuously until I was called. The patient and her husband became much alarmed, and sent for the doctor who had attended her, but were assured that nothing could be done; that it would cease in time, and that interference would be positively dangerous. On my first visit the discharges were so indescribably offensive that no one could long endure to remain in the room. With a view chiefly to remove this, and for purposes of cleanliness, I ordered a solution of permanganate of potash grains 10 in a pint of tepid water, to be used by injection, copiously, twice a day. In two days I made another visit, found all the stench removed, and the discharges not only natural in appearance, but far less copious. The treatment was continued two days longer, and the patient was pronounced cured.

The happy manner in which the salt acted in this case induced me to try it further in similar cases, and always with like results. I had used it, however, with a view only of destroying the fetor, but I observed not only a speedy change in the character of the discharge, but a marked diminution in the *quantity*. This led me to presume that in simple cases of *excessive lochia* it might be of service. I regret that I have not had more abundant opportunities for testing this, and will only say that in two cases of prolonged and excessive discharge that have recently come under my notice, the use of this agent was followed by very speedy relief. Now many of our authors claim that these prolonged discharges are the result of ulceration, either within the neck or on the os, and Cazeaux, among others, advises the use of the speculum and application of nitrate of silver. Whether they be justly ascribable to these ulcerations, as a rule, I do not know, having never resorted to the speculum to ascertain. But I doubt if the profession has generally accepted the theory. So far as my knowledge extends, physicians usually rely upon astringent injections, without the use of such unpleasant means as the speculum and caustics, and I believe their success is usually good. I am satisfied, however, that permanganate of potassa will be a valuable adjuvant to the treatment, if not sufficient alone to effect a cure more speedily than any other remedy. And even though some ulcers exist, I should not feel very doubtful of speedy success. This agent is well known to act most happily in promoting the healing of ulcerated surfaces. Indeed, in one case of ulceration of the neck, which had proved obstinate in the hands of another practitioner, the patient being a non-pregnant woman, I suggested to him the propriety of trying permanganate of potassa. He did so, and assured me that he was highly gratified with the results obtained. I trust that others may think it worth while to make use of this article in these and similar cases, and publish the results of their investigations.

ART. VIII.—*An Additional Test for the Diagnosis and Correction of the Optical Defects of the Eye.* By WM. THOMSON, M. D., Assist. Surg. to Wills Hospital for Diseases of the Eye, and late Assist. Surg. U. S. A.

BEFORE any object can be seen distinctly, the rays of light which are emitted or reflected from it, must be so refracted by the cornea, lens, and humours of the eye, as to cast upon the layer of the rods and cones of the retina its inverted and perfectly defined image.

If the eye be regarded as an optical instrument composed of a refracting apparatus, the cornea and lens, and a receptive screen, the retina, it needs no argument to prove that there must exist a harmony between the refractive power and the antero-posterior axis, to secure perfect definition.

The human eye may be thus described as a camera of one inch in length antero-posteriorly, with refracting surfaces which are equal to a lens of one inch in focal length: and only when the rods and cones of the retina are situated precisely at the principal focal point of the refracting combination, do the images of distant objects fall upon them, so as to be fully appreciated by the brain. Any variation in the length of the visual axis, without a corresponding change in the refractive apparatus, would render the retinal images indistinct, and would result in imperfect vision.

It may be considered as demonstrated by actual measurement, as well as by mathematical analysis, that the length of the visual axis does frequently depart from the normal standard, and that to this mechanical and anatomical fact, the defective vision in such instances may be ascribed. To the eye whose refractive system and visual axis harmonize, Donders has given the name Emmetropic, and to the eye which departs from this happy construction, Ametropic.

The ametropic eye may have a visual axis either too long, when it becomes Myopic, or too short, when it is called Hypermetropic. In myopia, the retina is too remote from the cornea and lens, and the images of distant objects are formed before it, and are indistinctly seen: its point of perfect vision is at a finite distance, which may, in extreme cases, be placed at one or two inches only anterior to its cornea. In hypermetropia, the axis is too short, and the images would fall behind the retina; objects are clearly seen, only when the refracting power of the crystalline lens is increased by a contraction of the ciliary muscle, and the focus of the refracting combination thereby shortened, to correspond with the diminished antero-posterior axis.

The following table will express numerically these diversities, as ascertained by the best authorities:—

Emmetropic.	Average length of axis	.	.	.	22 millimetres.
Myopic.	"	"	"	.	25 "
Hypermetropic.	"	"	"	.	20 "

Astigmatism is but a further subdivision of ametropia, in which one or both of the simpler forms may be found in the same eye, which may then be emmetropic in one meridian, and myopic, or hypermetropic, in the other ; or myopia and hypermetropia may coexist in the same eye, in meridians at various angles to each other.

To diagnose and correct the impaired vision caused by these forms of ametropia, the method usually employed clinically, is to place before the suspected eye various convex, or concave, spherical, or cylindrical, glasses of known focal length, and to direct the patient to examine with them certain test-types, those of Snellen being usually preferred, which are composed of letters of such sizes as to present angles of 5' at the distances at which they are intended to be seen.

As the power of refraction and length of axis are in the proper proportion in an emmetropic eye, any convex or concave glass must diminish its visual power : as the refraction is too great in myopia, its reduction by concave glasses improves vision : as the refraction is too low in hypermetropia for its short axis, convex glasses, by increasing it add to the visual power ; and in describing these defects the power of the glass, whether convex or concave, which gives the best definition, is used to designate the degree of ametropia.

The ophthalmoscope is also usefully employed to ascertain the state of the refraction of the eye, by examinations which are fully described in the text-books on ophthalmic surgery.

Usually, a full assortment of test-glasses are required, and with them, and the test-types, a series of careful observations must be made to ascertain the presence and degree of ametropia ; and as an addition to these methods, or when the apparatus above mentioned is not at hand, it is hoped that the simple test below described may be of service to those interested in this branch of surgery.

Let the reader take any strong convex lens, say one of six inches in focus, and standing at ten feet distance from a gas-light or lighted candle, project upon a piece of ground glass, held between the eye and the light, an image of the flame, which will be seen, inverted and distinct, when the screen is a little beyond six inches from the lens ; a circle of light replaces the image, increasing or diminishing in size, as the lens is moved to or from the screen. Now cover the lens with a piece of cardboard having two circular apertures in it, each $\frac{1}{4}$ inch in diameter, and $\frac{3}{4}$ inch apart, and two spots of light will appear on the screen when the lens is moved within or beyond its focus, becoming more distinct as this point is approached, and uniting into one distinct image of the flame at the proper focal point. The least movement from this point, will cause the image to become double ; and by this it is known that the screen is not placed at the point to coincide with the refractive power of the lens, or, in other

words, that the axis or distance from screen to lens is not harmonious with the refracting power.

This is precisely the condition of the ametropic eye, and by the simple test described below, its retina is enabled to perceive the double images it produces.

For this purpose a disk of sheet brass $1\frac{1}{2}$ inch in diameter may be placed directly before the eye, having in it, at a distance apart of $\frac{1}{8}$ inch, two perforations, each $\frac{1}{32}$ inch in diameter. When the eye regards a gas-light distant twenty feet through these perforations, two circles of diffused light are perceived at the disk, which overlap at their inner margins, and produce a bright elliptical space. Should the eye be emmetropic, the gas-light will be seen in the overlapping space, clearly defined and *single*; but if either myopia, hypermetropia, or astigmatism be present, *two* lights appear, but only where the circles overlap.

A card with two pin-holes one-eighth of an inch apart will enable any one to see the double images, after making himself myopic or hypermetropic artificially, by a concave or convex glass (preferably, however, a convex), through which he may look at a candle or gas-light, at a distance of ten or twenty feet, observing that the greater the distance from the object, the more marked will be the separation of the images.

So striking is the double vision thus produced, that a glance through the double diaphragm is sufficient to indicate any ametropia; and so exact is the test that with my own eye, corrected, and with relaxed accommodation, a concave or convex $\frac{1}{72}$ doubles the light; and my friend Dr. Wm. F. Norris, who is familiar with the subject of refraction, can detect a myopic astigmatism in one eye of a $\frac{1}{80}$ by the same means.

Having now ascertained that ametropia is present in any case, it will be requisite to know whether it arises from myopia or hypermetropia, and the following test will suffice. Draw through the two perforations a line, and holding the disk before one eye so that this line shall be horizontal, cover the right hole only with a piece of thin red glass, and if myopia be present a red flame will stand on the right side, and an uncoloured one on the left; but if hypermetropia exist the red image stands on the left, the uncoloured one on the right side. In myopia the double vision is direct or homonymous, in hypermetropia it is crossed.

By the rotation of the disk so that the line through the holes is carried from the horizontal to the vertical meridian, any existing astigmatism becomes apparent. In a case recently examined of myopic astigmatism of one-sixth in the horizontal meridian, the vertical being emmetropic, there was but a single image seen when the holes stood one above the other, but widely separated double ones when the holes were placed side by side.

It is evident that a correction of the visual defect can be made with the gas-light, since it only requires that the ordinary test glasses should be placed before the eye, armed with a double diaphragm, observing that in

hypermetropia concave glasses separate the images and that convex make them approach, until, when the eye is perfectly corrected, they unite into a single sharp image. The reverse obtains in myopia, the convex separating, and the proper concave, fusing them into one.

Should it be found difficult to fix the attention of children or unintelligent persons upon the overlapping space where alone the double images must be sought for, a number of openings may be used through which the object will be multiplied in proportion to the number of perforations which occupy the space of the pupil, and a disk of perforated Bristol-board has been found to answer very well in such instances.

There is one positive advantage over the test types which this method possesses, since the acuteness of vision does not enter so largely into the problem, and an eye of low visual power may be diagnosticated and corrected, so long as it can perceive a bright spot of light, and even an amblyopic eye can thus be examined if necessary. A patient was recently examined by the writer, who for several years past had been using concave glasses of $\frac{1}{15}$, there was entire loss of vision in one eye, and a decided nuclear opacity in the lens of the other, which prevented an examination by the ophthalmoscope to ascertain either the condition of the retina, or the state of the refraction. The acuteness of vision was $\frac{1}{12}$ only, and it was important to know in view of a possible operation whether the degree of myopia was really so great. She could easily perceive the test light, and it was found by the double holes that no glass would fuse the double images, but one that was equal to that which she had been using for some years.

To obtain a better and more steady object than a flame, I have used a disk of card-board nine inches in diameter, which is attached to a gas-burner so that it will rotate upon a pivot placed through its centre, on one side of which a slit four inches in length, and $\frac{3}{8}$ inch in width has been cut, and on the other, a circular perforation $\frac{3}{8}$ inch in diameter, both covered with tissue paper. These appear as a bright band and circular spot of light, having sharp outlines, and each subtending at twenty feet an angle of $5'$. For astigmatism the band can be placed at any angle by rotating the disk, and when so used the two small perforations should be placed before the eye at right angles to the direction of this band.

Having now described in detail the use of a double perforation, it remains to show that from the same causes, an ametropic eye can be recognized by a single perforation in the diaphragm; for when a bright point is garded by such an eye, and the disk with the single opening held close to the cornea is moved rapidly, the light will appear to dance, to an extent which will depend on its distance from the eye, and on the degree of the ametropia. The single diaphragm is useful as a check upon any other method of correction, for until all ametropia is removed by proper glasses,

the point of light will continue to dance or move in some one or other direction.

These observations will all hold good for myopia, but for hypermetropia, I wish it to be understood that they presuppose a relaxation of the accommodation.

The power of accommodation seems, however, to be to a certain extent neutralized when the eye looks through these small openings, and in three individuals specially examined for this purpose, it was found to be reduced from a $\frac{1}{4}$ to $\frac{1}{11}$ in one, and from $\frac{1}{4}$ to $\frac{1}{24}$ in the other two, as tested by the ability to fuse the double images at twenty feet through concave glasses. Further clinical observation will be requisite to ascertain this point so important in the recognition of the degree of hypermetropia.

To enter upon the discussion of the optical laws by which these various effects are produced, would extend this paper beyond its allotted space, as would likewise any complete history of the observations of others, although it may be said that Scheiner, in 1619, described the effect of a screen with two slits in causing double images of an object when placed within the point of perfect accommodation; that upon the same law optometers have been constructed by Young, Stampfer and others, and that Helmholtz, in his *Physiological Optics*, explains the use of such diaphragms, to ascertain the near point, in his discussions on the range of accommodation.

As a ready means, however, of recognizing and correcting ametropia, for which it is proposed above, it is hoped that it may be found to possess some clinical value.

1607 LOCUST STREET, PHILADELPHIA.

ART. IX.—*New Observations on Dr. E. Groux's Case of Congenital Fissure of the Sternum.* By HENRY HARTSHORNE, M. D., Professor of Hygiene in the University of Pennsylvania.

DURING the late meeting of the American Association for the Advancement of Science, at Salem, Mass., a special *séance* was held, for the repetition, by Dr. Upham and Mr. Farmer, of some remarkable experiments upon Dr. Groux; manifesting, by the aid of electrical apparatus, the main peculiarities of his case. A subsequent opportunity occurred to the writer to make a close and particular examination, which, with the perusal of the documents now accumulated concerning the case, suggested some remarks. Although Dr. Groux, both before and since his entrance into the medical profession, has, in his extensive travels, made his case known to a very great number of medical men, yet in proportion to its importance it has

not had a large place in medical literature, especially in the journals of this country. Ten years ago M. Groux visited Philadelphia, and, as the result of his examination, Dr. DaCosta communicated to the Pathological Society a valuable paper.¹ Since then the apparatus of Dr. Upham and Mr. Farmer has been perfected, and some very important observations have been made, well worthy of the attention of physiologists and physicians. I have deemed it not improper, therefore, to endeavour succinctly to bring the history of the case down to the present time.

In regard to the rarity of the case, I am indebted to Dr. Upham for some additional references, collated by Dr. R. M. Hodges, of Boston; the paucity of which, with those previously known, will show how nearly the case approaches to being actually unique. This character is obvious as regards the present generation, from the fact that no one of the more than two thousand physicians in Europe and in this country, who have examined the case, has met with its parallel. The only examples of any near resemblance to it, yet pointed out, appear to be the following:—

Harvey's case, of a young nobleman, whose heart was exposed by fracture of some of the ribs upon the left side, and destruction of the soft parts by ulceration. Cullerier's case, presented in 1821 to the French Academy of Medicine;² that of a woman who had reached the age of 31 years, without inconvenience from a congenital deficiency of almost the whole of the lower half of the sternum. Dr. J. H. Bennett's reported *post-mortem* inspection of a case, whose previous history was not known.³ That of Dr. Lyons, of Dublin, occurring in a boy deformed by lateral curvature of the spine, with deviation and imperfection of the ribs upon the left side, showing the movements of the heart.⁴ A child presented when ten days old to the Société de Chirurgie, by M. Marjolin,⁵ in which a continuous line united the clavicles, the sternum being *bifid* and almost absent. Case reported by Dr. Louis Benjamin, of a child in which the sternum was substituted by two long narrow cartilaginous bands, from the clavicles to the seventh ribs.⁶ A case recorded in 1839,⁷ of a child born feeble, with distressed respiration, with entire absence of the sternum. It probably was short-lived. A child thirteen years old, mentioned in the tenth volume of the *Brit. and For. Medico-Chirurg. Review* (p. 257), and one cited in the *Gazette Médicale*, Aug. 7, 1841 (p. 497), from a description by Monod and Cruveilhier, in 1841. A German, who, at the age of 22, was found on examination for military service to have almost

¹ Trans. of Phila. Pathol. Soc., vol. i. p. 203.

² Journ. Gén. de Méd., t. 74, p. 305.

³ Monograph by Dr. E. Groux, upon his own case. Hamburg, 1859.

⁴ Ibid.

⁵ Gazette des Hôpit., Aug. 3, 1858.

⁶ Am. Journ. of Med. Sciences, N. S., vol. xxii. p. 209; vol. xxiv. p. 488; from Zeitschrift für die gesammte Medecin.

⁷ Archiv. Gén. de Méd., 3me serie, t. ix. p. 81.

entire deficiency of the sternum. He enjoyed good health, and followed the business of a musician.¹ A case of partial sternal fissure, reported by Dr. A. M. Slocum,² to the Phila. College of Physicians, July 7th, 1859. Of all of these, probably the greatest resemblance to that of Dr. Groux was in the case brought forward by Cullerier.

Some diversity of opinion has always existed in reference to the medical anatomy of M. Groux; as to the precise nature of the visibly pulsating tumour in the sternal fissure. The majority of names has been attached to the view that this pulsation belongs to the *right auricle*. So pronounce, among others, Forget, of Strasbourg, Béclard, Aran, Piorry, and Pouchet, of Paris; Pavy, C. J. B. Williams, J. H. Bennett, and W. T. Gairdner, of Great Britain; Upham and Da Costa, of this country. To the opinion that it is the *aortic* pulsation that is felt, subscribe Bouillaud and Marc D'Espine. That it is the *right ventricle*, Jas. Paget, W. Baly, Traube, and Virchow. The last named, however, upon a second examination with the aid of Dr. Upham's apparatus, was induced to modify his judgment. The late Dr. J. Snow, of London, believed the pulsation to be due to a *regurgitation* from the right ventricle into the auricle. Dr. Francis Sibson considers that the aortic pulsation is seen during inspiration, and that of the right auricle in expiration. Dr. J. Hysern, of Madrid, believes the right ventricle to form part of the tumour.

One of the points of greatest interest to determine by examination of this case is, that of the synchronism or succession of the movements and sounds of the different cavities of the heart. To an exact investigation of this Dr. Upham has devoted attention with gratifying success.³ With the aid of Mr. Farmer, of Boston, the *sphygmophone* was devised, by which, sounds being produced by the striking of bells upon the breaking of magnetic circuits, through the rising of fluid in tubes, the *ear* was enabled to trace distinctly the succession of the impulses, of the auricle, left ventricle, and aorta. Afterwards, by the application of Bond's registering chronograph, Dr. Upham was enabled to measure the *precise interval* occurring between the auricular and ventricular, and again between the latter and the aortic movements. Taking the whole duration of a pulse-beat and interval as 1000, the commencement of the beat proceeding from the medio-sternal tumour being .000, the interval to the apex beat was found to be .038; to that of the ascending aorta, .160; that of the radial artery at the wrist, .235. The sphygmophonic experiments were satisfactorily repeated before the members attending the late Scientific Convention at Salem; the same general facts being also ocularly demonstrated by the rising and falling of liquids in tubes placed respectively over the

¹ London Med. Gazette, Nov. 8th, 1844; from Medicinische Zeitung, No. 10, 1844.

² Am. Journ. of Med. Sci., N. S., vol. xxxviii. p. 406.

³ See Boston Medical and Surgical Journal, 1859.

aorta, apex, and medio-sternal tumour.¹ The introduction, by these observations, of the elements of certainty and numerical precision into the inspection of the movements of the heart and great vessels, appears to the writer to be an important contribution to the study of the physiology of the circulation.

A few words may suffice to express the reflections and conclusions induced by my own inspection of Dr. Groux, and consideration of the history of his case.

First, as to its regional anatomy; is it the right auricle only that lies, visibly pulsating, in the sternal fissure? The dissenting opinions, though so largely in the minority, are not to be passed over without some attention. Jas. Paget, W. Baly, and Traube, of Berlin, pronounced it, as we have seen, to be the right ventricle; and Virchow at his first view of the case did the same. It is true that the changes connected with the cessation of respiration and circulation may make an essential modification in the relative position of the thoracic organs after death. But the limits of percussion-dulness, as well as those of the greatest distinctness of the cardiac sounds compared with the known *dimensions* of the heart, and the site of the impulse during life, would seem to show that the right ventricle must be partly exposed in the fissure. How much of it, is the question; and what part does it take in the visible pulsation? By means of feathers made to adhere in the erect position over different portions of the space under inspection, Dr. Groux exhibits beautifully the movements, shown to be not the same above and below. In the middle of the tumour the feather undergoes a sort of *gyration*, tilting first downwards and towards the left, then to the left, upwards, upwards and to the right, directly towards the right, and lastly a little downwards towards the right, by easily traced and gradual succession. Below, when the heart is forced downwards by a deep inspiration, the feather is made to move only in one direction, inwards or downwards and to the right; this movement following the former (at least in its commencement) by a very short interval. A noticeable fact is the *distension* of the medio-sternal tumour, with marked dulness on percussion, when Dr. Groux "holds his breath," without any other effort. This is quite a distinct phenomenon from the enlargement produced *above* the tumour by speaking or coughing, which is obviously from protrusion over the base of the heart, of a portion of one or both lungs.²

This dilatation on interference with the pulmonary circulation seems to be one of the most positive evidences of the auricular character of the visible pulsating tumour in the fissure. But it does not exclude the

¹ This last corresponds with the sphygmoscope of Dr. Scott Alison.

² The degree or amount to which this protrusion occurs has been thought by some to favour the *expiratory* theory of emphysema.

idea that it is partly ventricular also. Probably, I think, this is its character. Dr. Lionel S. Beale has given precisely this opinion.¹ We are, perhaps, too much prepossessed by anatomical considerations with the expectation of abrupt difference or separation between the parts or acts of the cardiac contraction and dilatation. Separation and distinct succession of the *sounds* do not prove this abruptness to exist in the mechanical movements, because the sounds have modes of causation not altogether identical or co-existent with the muscular action of the heart. I consider that the most positive lessons of Dr. Groux's case are, first, as shown most completely by Dr. Upham's and Mr. Farmer's experiments with the sphygmophone and chronograph, the *non-synchronism* of the auricular, ventricular, and aortic movements; secondly, the *gradual* nature of the transition from the one motion to the other. As Dr. Forget expresses it especially in regard to what he regards as auricular: the motion takes place "*mollement, sans brusquerie*;" "*ondulant, sans saccades*."² A writer in the *Lancet*³ uses this language: "The diastole and systole are alternate, but not of that steam-engine-piston character, up and down, as is usually thought." On the whole, it appears to me that the first part of the motion of the medio-sternal tumour in Dr. Groux, that which makes the first signal of the sphygmophone, is auricular, from the entrance of blood from the *venæ cavæ* into the right auricle; that this is followed by the "*vermicular*"⁴ contraction of the auricle, succeeded, *not suddenly*, by the contraction of the right ventricle, which concludes the feather-movement or gyration above described. The contractions of the left auricle and left ventricle are, most probably, under normal circumstances, synchronous with those of the corresponding parts of the right heart. The *lowest* feather-movement perceptible would seem to belong alone to the right ventricle, and appears to me to indicate that the ventricle in contracting moves or falls away *from* the middle wall of the chest. In the language of Dr. C. J. B. Williams, "It is a movement of retraction, because the systole of the ventricle withdraws it from the surface."⁵ So far I regard it as confirming the observations of Dr. Pennock, made many years ago, showing that the heart is *elongated* as well as twisted during its systole.

Concerning the sounds, the most remarkable fact in Dr. Groux's case is the presentation of a *single* sound when the stethoscope is placed, without much pressure, over the (supposed) auricular portion of the tumour.⁶ Dr.

¹ Observations, &c., by Dr. E. Groux, 2d ed., Hamburg, 1859, p. 3.

² From Gazette Médicale de Strasbourg, in Dr. Groux's *Abhandlungen und Notizen*, &c., Hamburg, 1857.

³ June 23d, 1855.

⁴ M. Forget, *loc. citat.*

⁵ Observations, &c., by Dr. Groux, p. 5.

⁶ The word *tumour* is used for convenience, without being precise. No tumescence exists except at the moment of the visible pulsation.

R. D. Lyons, of Dublin, speaks of this as giving "a single sound and a single impulse."¹ Dr. C. J. B. Williams calls it "a distinct sound, accompanying the commencement of the auricular contraction, and ending in the less abrupt and more distinct sound of the ventricular systole."² Dr. Da Costa observes that it is not always alike, but may be described as one continuous sound, whose commencement is different from its close. He remarks also upon a peculiar click heard at its termination, ascribed to the drawing away of the integument from the end of the glass stethoscope which was used. With a different instrument I did not hear this click. Dr. C. J. B. Williams also refers to a *duplication* of the second sound, occasionally heard over the upper aortic portion of the fissure. He is no doubt right in explaining this by the non-synchronism of the valvular sounds of the aorta and pulmonary artery. Usually, however, these are synchronous.

Now, as to this single "auricular" sound—to my own ear it was very distinct and continuous, and by using two stethoscopes it was easily contrasted with the double ordinary succession of sounds, first and second, over the aortic region. Is it auricular only? Let me quote Dr. Da Costa's words upon this:³ "I confess, although it is heard exactly over the seat of what may be presumed to be the auricle, that I am by no means fully convinced that it is caused by the movements of the auricle or of the blood in it. I am not quite sure that it is not a valvular sound produced at the tricuspid orifice, and heard so distinctly, because, owing to the malformation, the stethoscope can be placed directly over, or quite near to the seat of its production." With the view here suggested I am quite prepared to coincide. The sound in question was very faint, if perceived at all, at the commencement of the rising of the pulsating tumour. Placing a finger over the apex of the heart, while the ear received the sound by a stethoscope over the auricle, *no* interval could be apprehended by me between the maximum of the sound's force, at or near its close, and the impulse of the apex. That is, the main portion of the *sound* over the auricle *followed* the *impulse* of the same, and *coincided* with the *ventricular* systolic impulse. This is confirmed by the language used by some of the distinguished authorities already quoted, concerning this case. Says Jules Béclard:⁴ "The right auricle forms across the soft parts a tumour, the maximum *diminution* of which is synchronous with the shock of the heart against the pectoral walls." M. Aran,⁵ "the isochronism is perfect between the collapse or *contraction* of the auricle and the enunciation of the first sound by the person who auscults." The Committee of the New

¹ Observations, &c., by Dr. Groux, p. 4.

² Med. Times and Gazette, Nov. 28, 1857.

³ Trans. Pathol. Society of Philada., *loc. citat.*

⁴ Observations, &c., by Dr. Groux, p. 2. ⁵ Union Médicale, 28 Mars, 1855.

York Pathological Society¹ reports that "the *contraction* of the tumour is synchronous with the impulse of the heart, at the level of the fifth rib."

I would hold, then, that in this continuous sound we must distinguish, mentally, two portions. The first and least of these may be believed to be auricular, owing to the rush of blood from the *venæ cavæ* dilating the auricle; this being followed at once, without interval, by its contraction. In a cardiographic record of the movement of the auricle in Dr. Groux's case, inscribed by Marey in that gentleman's Album, there are two waves of ascent; the first of much the greatest height, the second being followed by an abrupt and considerable descent. The first would be referred by me to the dilatation of the auricle by the influx of blood from the *venæ cavæ*, the second, to the alteration of the form of the same cavity as it contracts. The properly auricular sound is, I believe, mainly a *bruit d'écoulement*, most intelligible in view of the observations of Savart, Plateau, and Maurat² upon the demonstrable vibrations accompanying the movement of all fluids, even when occurring in one uniform direction and in smooth tubes. But the main portion of the sound referred to I must believe to be the *first sound of the heart*, from the ventricular systole, closing the tricuspid valve; identical, therefore, with the first sound as heard, at greater distance, over the apex or aorta. Why do we not hear the second sound also over the auricular tumour? As we do hear it, over the same region, in the presence of the sternum in ordinary subjects, its absence in Dr. Groux's case was certainly a surprise. But it appears to me that the following explanation may be sufficient. Commonly the sternum, perhaps both by its physical resistance and by its influence upon the sonorous vibrations of the cavities of the heart, causes a blending of the auricular sound with that of the ventricular systole, so that the former is individually lost. At the same time the sternum conducts the *second* sound to the ear, wherever it may be placed so as to hear the first. This bone being absent in Dr. Groux, we find that the auricle does not receive the second sound through the ventricular walls, or through the blood which it has just propelled, so as to be audible. Placing the stethoscope a little further to the left, or below, over the ventricle, the second is heard with the first sound. On reflection, I think we will find that this is what might be expected, if the commonly accepted explanation of the second sound is correct, viz., that it is produced by the closure of the semilunar valves under the arterial rebound following the systole of the ventricles. The separation of the first sound, over the auricle, from the second, seems also to confirm the view that this sound is directly connected with the closure of the auriculo-ventricular valves. As suggested by Dr. Hysern,³ we might designate the first sound as being *ventriculo-*

¹ Drs. Peaslee, Dalton, and Metcalf.

² *Revue des Cours Scientifiques*, 3 Juillet, 1869, p. 490 *et seq.*

³ Commission of the Central University of Spain, on Dr. Groux's case, July, 1856.

valvular, and the second as *arterio-valvular* in origin. I would repeat, then, that the auricular *impulse*, visible to the eye, and made audible by Dr. Upham's sphygmophone, is, at first and mainly, a movement of *dilatation* of the auricle; that this is attended or followed at its *close* by the auriculo-ventricular *sound*, the first sound of the heart, which is thus synchronous with the impulse of the heart's apex against the walls of the chest.

It may interest many members of the profession to know that Dr. Groux is now practising medicine in the town of Williamsburg, in the State of New York. With that commendable regard for the scientific interest of his conformation which he has always shown, his will, a copy of which is in the possession of Dr. Upham, of Boston, provides for arrangements by which, in case of his death in any part of this country, a complete autopsic inspection shall be made, for comparison with the now so well-known history of his case.

ART. X.—*On Instantaneous Rigor, as the occasional Accompaniment of Sudden and Violent Death.* By JOHN H. BRINTON, M.D., Surgeon to the St. Joseph's Hospital; Surgeon to the Philadelphia Hospital; late Surgeon U. S. Volunteers.

To the eye of the military surgeon, one of the most startling and interesting phenomena of the battle-field is the retention in death of the last attitude of life; a condition not unfrequently observed in the bodies of those whose death has been violent and instantaneous. That this subject has attracted but little attention is scarcely to be wondered at, when we consider the manifold and pressing duties of the medical officer during and following action; duties which are not completed until long after the burial parties have done their work, and have removed from the field all traces of the dead.

During the recent civil war, I at different times had the opportunity of passing over the field of battle shortly after the close of action, and on several occasions I have been greatly surprised at the extraordinary attitudes presented by the bodies of those who had fallen, with wounds apparently instantaneously fatal, as of the head or heart. In many of these instances the body was rigid throughout, and the position was unquestionably that of the last moment of life. The muscles had, as it were, been surprised by death, and the limbs remained set and fixed in the posture held at the moment of the reception of the fatal wound.

The importance of a proper appreciation of this condition in death, in a medico-legal point of view, is undoubtedly great, and the following ex-

amples of the occurrence of instantaneous rigor following violent sudden death, are accordingly submitted. They have either been observed by the writer, or have been reported to him by eye-witnesses, whose accounts have been carefully examined into, and may therefore be regarded as reliable.

At the battle of Belmont, in Missouri, in November, 1861, I examined the body of a United States soldier of about 40 years of age, who had been shot through the head obliquely from the front to the back. At the moment of death this man was kneeling by the side of a small tree, and was evidently in the act of firing his piece. When examined, the body, not yet cold, was resting upon the right knee and leg, the left leg was bent with the foot upon the ground. The left hand clenched firmly the barrel of the gun, the butt of which rested upon the ground. The head, drooping upon the chest, and to one side, rested against the tree. The attitude of the trunk was generally somewhat forwards. The jaw was fixed, and the rigidity of the body perfect. The clutch of the hand upon the piece was firm. At first glance I supposed the attitude to be one of life, and I could scarcely convince myself, even by close examination, of the existence of death, so life-like was the statue.

At the battle of Antietam, in 1862, I examined the body of a Southern soldier of middle age, who had been killed at the side of the sunken road which skirted the well-known field of corn. This body was in the semi-erect posture, one of the feet rested firmly on the ground; while the knee of the other leg, slightly flexed, pressed against the bank of earth forming the side of the road. One arm extended, was stretched forwards, the hand resting upon the low breast-work of fence rails thrown up to protect the trench. His gun, with ramrod driven half-way down, had dropped from his hand, and lay on the ground beside him. This man had evidently been killed while loading, and in the act of rising from his knees to his feet, probably for the purpose of observation; a ball had passed directly through the centre of his forehead, and had emerged posteriorly.

The fire at this point in the field must have been extremely hot, for in the adjoining cornfield, I counted in an area fifty or sixty yards square, forty dead bodies. Many of these lay in extraordinary attitudes. Some with their arms raised rigidly in the air; some with their legs drawn up and fixed. In not a few the trunk was curved forwards and fixed. These attitudes, in a word, were not those of the relaxation of death; but were rather of a seemingly active character, dependent apparently upon a final muscular action at the last moment of life, in the spasm of which the muscles set and remained rigid, and inflexible.

The death, in the majority of these cases, had resulted from chest-wounds; in fewer instances from shots through the head and abdomen. The latter were accompanied by considerable hemorrhage, as was evident from the pools of dark-coloured blood by the side of the bodies. These examinations were made about thirty-six hours after death, and also later.

Dr. Thomas B. Reed, late Surgeon U. S. Volunteers, has communicated to the writer a singular instance of early rigidity observed by him at the battle of Antietam.

It occurred in the person of a U. S. soldier, apparently 17 or 18 years of age, who had been shot through the heart. The right arm in this body

was raised above the head and rigidly fixed. The hand still held the cap, with which he had been cheering on his comrades at the last moment of life. A peaceful smile was on his face.

The same surgeon, at the battle of Williamsburg, also examined the dead body of a U. S. zouave, who had been shot directly through the forehead, as he was climbing over a low fence. His, too, was the last attitude of life; one leg half over the fence, the body crouching backwards. One hand partially clenched and raised to the level of the forehead, presented the palmar surface forward as if to ward off an approaching evil.

The following instance of fixation of the body was observed by Dr. Henry Stillé, and communicated to the writer by his brother, Mr. Louis S. Stillé. Dr. Stillé, while seated on the top of a freight car on the Nashville and Chattanooga Railroad, saw a brakeman instantaneously killed by a shot between the eyes, fired by a guerilla from the woods through which the train was passing. The murdered man was screwing down the brakes at the moment of the shot. After death the body remained fixed, the arms rigidly extended on the wheel of the brake. The pipe, which he had been smoking, remained still clasped between the teeth. So perfect was the rigidity, and so tight was the grasp of the hands, that the body was with difficulty disengaged from its post-mortem position.

Equally remarkable was the following case, which has been furnished to the writer by Mr. J. N. Burtnett, at the time of the observation a soldier in the United States service.

While a detail of United States soldiers were foraging in the vicinity of Goldsboro, N. C., they suddenly came upon a party of Southern cavalry dismounted. The latter immediately sprang to their saddles; a volley at about two hundred yards range was fired at them, apparently without effect, as they all rode away with the exception of one trooper. He was left standing, with one foot in the stirrup; one hand, the left, grasping the bridle rein and mane of his horse; the right hand clenching the barrel of his carbine near the muzzle; the butt of the carbine resting on the ground. The man's head was turned over his right shoulder, apparently watching the approach of the attacking party. Some of the latter were about to fire a second time, but were restrained by the officer in charge, who directed them to advance and take the Southern soldier alive. In the meantime he was called upon to surrender, without response. Upon a near approach and examination, he was found to be rigid in death, in the singular attitude above described. Great difficulty was experienced in forcing the mane of the horse from his left hand, and the carbine from his right. When the body was laid upon the ground, the limbs still retained the same position and same inflexibility. This man had been struck by two cylindro-conoidal balls, each from a United States Springfield rifle. One entered the body at the right side of the spine, and emerging near the region of the heart, dented the saddle skirt, and dropped upon the ground. The other entered at the right temple, and had no apparent exit. The horse had remained quiet, being fastened by a halter.

These two last cases are exceedingly valuable, and prove beyond all doubt the possibility of the occurrence of instantaneous rigor, following gunshot injuries of the head. In each case the man at one moment was seen to be alive, the shot was seen to be fired, and almost instantly the

presence of universal rigidity of the muscular system was demonstrated, as the accompaniment of the instant death of the individual.

I have also several times passed without examination the corpses of men who had fallen with their muskets in their grasp, pointing forward, and carried as if on the advance or charge. These bodies were usually prone, face to earth, the trunks somewhat bent, and the limbs apparently rigid.

In the report of M. Chenu,¹ a short account, based chiefly on the communications of MM. Armand and Périer, is given of the attitudes of the dead in battle during the Crimean and Italian campaigns. According to M. Armand, who examined the dead of Magenta the day after the battle, a great number retained in part the attitude which they had at the moment in which they were struck, and appeared to have passed instantly from life to death, without agony, and without convulsions. Those shot through the head had generally fallen with their faces to the ground, and for the most part grasped their arms. At the battle of Inkerman, some bodies rested with their knees to the earth, their guns convulsively grasped, and their cartridge in mouth. Some lay with upraised arms, as if to parry a blow. Others appeared to have died in prayer, their rigid hands and interwoven fingers still raised in supplication.

At Magenta lay the body of a foot soldier who had died in hand-to-hand conflict, with arms raised in front, one extended, one bent, and with fists clenched. Here also an Hungarian hussar, killed at the same time as his horse, remained almost in saddle, resting on his right side, the point of his sabre carried forward, as at the charge.

In the observations quoted by M. Chenu, attention is drawn to the facial expression of the dead. Examples are cited, in some of which there seemed to be a "calm and pious resignation," a "smile toward heaven," an "expression of exalted beatitude," and as it were a "murmured prayer," upon the silent countenance. In some there appeared the expression of anguish and despair, in others that of menace and hate. It is quite possible that, at times, such may be the case, where sufficient interval is left for the dying man to think. Certain it is, as many a military surgeon can testify, that the last thought of one, stricken in battle unto death, is of home, wife, children, parents, friends. The writer can well recall instances in which it seemed to him that the dead countenance still bore the impress of the last fitting thought of life.

The same rigidity following instantaneous death, is also witnessed in animals: thus I have seen a dead battery-horse, with a ball through the centre of his forehead, remain for many hours upright on his knees, his head curved in air, semi-erect, rigid, and unsupported. Two other horses,

¹ Rapport au Conseil de Santé des Armées, sur le service médical, etc. etc., par J. G. Chenu, Docteur en Médecine, etc. Paris, 1865.

killed at the same moment, lay on their back and side, the usual attitude of dead animals. A similar instance to the first mentioned has also been reported to me.

From the observations of the French surgeons above alluded to, it would seem that the rigidity of sudden violent death may accompany heart as well as brain wounds. In two cases I have seen this to an imperfect degree, and an account has been furnished me of the death of a soldier of the 4th Wisconsin cavalry, who in 1864 was shot apparently through the heart in a guerilla skirmish in Louisiana. He was instantly lifted by his comrades into a captured buggy, and died as he was placed upon the seat. The vehicle was then dragged along for half an hour, at a rapid pace, by ropes fastened to the saddles of the troopers, when the body was taken out and found to be rigid and bolt-upright in death.

A remarkable example of this rigidity, following most probably wound of the lung and vessels, was witnessed by the writer at Belmont, Missouri. After that action, in riding from the field, he met a young United States infantry soldier, who had been shot some two hours previously through the left breast, rather below the region of the heart. This man had managed to find a stray mule, which he had mounted without saddle, and was endeavouring to reach a place of safety and succor. His symptoms were those of gunshot wound of the lung, as evinced by great dyspnoea, and expectoration of blood. He gradually became weaker and weaker, and shortly died as he rode by the writer's side. His eyes glazed, the jaw immediately fixed, and the signs of death seemed unequivocal. The corpse, however, remained in its upright mounted position, and when, after the lapse of many minutes, and after considerable ground had been passed over, it became necessary to appropriate the mule to the use of a living wounded soldier, the body was found to be so firmly and rigidly set as to demand a certain amount of positive force to free the mule from the clasp of its legs. When placed upon the ground, the rigid sitting posture was retained.

In endeavouring to learn something of this very extraordinary and, in civil life, comparatively rare form of cadaveric rigidity, I find but little on record save the article in M. Chenu's report already alluded to. The same phenomena have occasionally been observed in death from asphyxia, and a number of instances of early rigidity, more or less complete, may be found in Morgagni.¹ According to M. Fodéré, of Strasbourg, subjects who have died of hemorrhages present often an extreme rigidity, retaining the positions which they last occupied in life. An instance is also cited by MM. Marc and Lucas,² of an old man who died at a theatre. Here the body remained seated, the forehead supported on the crossed hands, the elbows resting on the ledge of the box.

One of the most famous cases of this kind is reported by M. Marc,² and

¹ *Epis. Anatom. Med., and De Sed. et Caus. Morb.*

² *Annales d'Hygiène publique, et de Médecine légale, t. vii.*

occurred at Dunières in France, in the person of one Courbon, æt. 37, an habitual drunkard. This man was one morning found dead in a trench, in such relation of trunk and limbs that the weight of the body was supported by the head and feet, a position which could only be maintained by the stiffness of the articulations. This rigidity in an unnatural attitude must have been developed at the moment of death, or else, on the theory of murder, the body must have been supported in the posture until cadaveric rigidity had set in, an unlikely supposition.

The post-mortem examination showed that death had occurred from apoplexy brought about by intemperance. Of like nature is the case of Mrs. Reid, cited by Watson,¹ in which the body of the woman, aged 56, was found in a sitting posture in front of her bed, with her head erect, and holding up her right arm and hand. Murder on the part of her husband was suspected, but the evidence was deficient, and despite marks of violence, a verdict of "not proven" was found.

What is the nature of this instantaneous rigidity which occasionally accompanies sudden violent death? This is a most interesting question, and one somewhat difficult to answer. Dr. Carpenter regards the contraction as one "obviously of a tetanic character, which ceases after a few hours; is then succeeded by a state of flexibility, after which the ordinary rigidity supervenes." If a comparison be made between the ordinary rigor mortis, or cadaveric rigidity, and the instantaneous rigor of sudden violent death, or the rigor of the battle-field, if I may use the expression, it will be found that while in some particulars the two approach each other closely, in others they are widely different.

Development.—The ordinary rigor mortis is developed after muscular irritability has ceased, but before putrefaction has set in. The appearance of the rigor of the battle-field is probably synchronous with violent sudden death.

Invasion.—In ordinary rigor mortis, the march is downward; the parts first affected are the neck and jaws; the lower jaw, if previously relaxed, is drawn up; the flexor muscles are supposed to be affected in the greater degree. Battle-field rigor affects probably all regions alike and at once, the extensor equally with the flexor muscles.

Duration.—That of ordinary cadaveric rigidity is usually from twenty-four to thirty-six hours, although exceptionally it may last for days. The duration of the rigor of the battle-field is probably much longer than is usually supposed. I have seen bodies rigid in their last attitude, twenty-four, forty-eight, and in one instance nearly sixty hours after death. M. Armand, at Magenta, saw this rigor twenty-four hours, and M. Perier, at Alma, forty-eight hours after death. The fact of the prolonged continuance of this rigor would seem to militate against the idea of its tetanic nature, and of its being followed in turn by flexibility and by rigor-mortis proper.

¹ Watson: *Medico-legal Treatise on Homicide by External Violence*. Ed. 1857. pp. 70, 276.

The departure of cadaveric rigidity is in the same order as the invasion. Concerning the departure of the battle-field rigor, I have no data. In exceptional cases, cadaveric rigidity may make its appearance early, and last but a short time. This is a well-known occurrence in animals hunted to death, or which have died from fighting.¹ It also happens in death from the stroke of lightning. A like early appearance and short duration is also observed in men who have died under exhausting conditions, such as wasting disease, or convulsions. But even here an interval of time does exist between the occurrence of death and the appearance of rigidity, and the latter follows its usual march from above downwards.

To the causes of the two forms of rigor-mortis, I will but allude. Those of the ordinary cadaveric rigidity are still under discussion, although supposed to be chiefly due to the setting or solidification of the muscular juices, under the action of an acid developed in them.

I regret not having been able to examine more closely the nature of the fatal lesions, which were present in those cases of instantaneous rigor I have observed. But as is well known, so great are the exigencies of service during and after action, that the medical officer has little or no time to think or act, save as regards the interests and wants of his wounded. He must busy himself with the living, rather than with the dead.

From a careful consideration, however, of all that I have seen and collected on this topic, I am inclined to believe that in all of these cases of battle-field rigidity,

First, The rigidity has been developed at the instant of death.

Second, The cadaveric attitudes exhibited are those of the last moment and act of life.

Third, The death most probably has been instantaneous, and unaccompanied by convulsions or agony.

Fourth, The rigidity is probably more lasting than is usually supposed.

Fifth, It is very doubtful whether this instantaneous rigor of sudden death, or rigor of the battle-field, is succeeded by flexibility in its turn to be followed by the ordinary rigor-mortis.

ART. XI.—*Pendulous Pedunculated Bronchocele successfully Removed.*

By GEO. C. BLACKMAN, M. D., Professor of Surgery in the Medical College of Ohio; Surgeon to the Cincinnati Hospital; and to the Samaritan Hospital, etc.

MR. ERICHSEN, in his most excellent treatise on *The Science and Art of Surgery*, Am. ed. 1869, p. 825, after alluding to the serious character of the operation for the removal of an enlarged thyroid gland, and express-

¹ Gulliver, Ed. Med. and Surg. Journ., Oct. 1848.

ing the opinion that such extirpation should not often be attempted, thus remarks :—

“ I have more than once been tempted to remove large pendulous pedunculated bronchoceles, but close examination has satisfied me in all such cases that the neck of the tumour was so vascular, containing large arterial and venous branches, and so intimately connected with the sheath of the carotid, stretching under the sterno-mastoid, which was expanded over it, that no operation could be safely undertaken. In the event of its being thought desirable to operate, the better plan would be, after exposing the tumour, to enucleate it as much as possible with the handle of the scalpel, ligaturing carefully all the vessels divided as they were cut.”

We submit the report of an operation which we performed at the Samaritan Hospital during the past winter, believing that the plan adopted is worthy of imitation in similar cases. The details of the case were furnished me by Dr. De Courcey, one of the resident physicians of the Institution.

Frederika Ruckdaschel, German, æt. 36, unmarried, was admitted February 26th, 1869. She was of fair complexion and had always enjoyed good health. There was an enlargement of the thyroid gland on the right side, which had existed for fifteen years. It had never given her much annoyance, and it was only on account of the unsightly deformity that she urgently requested its removal. The tumour was of an oblong shape, about three and a half inches in length, and four inches in circumference, looking much like a banana. In the presence of the class of the Medical College of Ohio, and assisted by Dr. Glover Perrin, U. S. A., and others, I divided the integuments over the most prominent portion of the tumour, so as to completely expose the morbid growth. With the handle of the scalpel and fingers the tumour was completely isolated, with but trifling hemorrhage, until its base was reached. The whole mass was then suddenly wrenched from its connections, and for a few moments the hemorrhage, both from the superior and inferior thyroid arteries, was truly appalling. A sponge was quickly thrust into the wound, but was saturated at once, when it was withdrawn, and pressure with the fingers was made directly upon the bleeding vessels. In the course of a few minutes a sponge was again inserted to the very bottom of the wound, whilst another was applied directly over it, and retained *in situ* by means of a needle, which transfixed the lips of the wound, and the twisted suture. The hemorrhage was now arrested and the patient placed in her bed with the injunction to keep the head and neck as quiet as possible. The sponge nearest the surface was removed on the 2d of March, six days after the operation, but the other was allowed to remain until the 8th of March, the offensive odour having been corrected by a solution of carbolic acid. The wound, which was of great depth, healed with but little suppuration, and the patient left the hospital entirely cured on the 22d of March.

Dr. Perrin, who was the first to inspect the extirpated tumour, called attention at once to the fact that it embraced not only the isthmus of the thyroid, but also the left lobe, which was somewhat atrophied. The disease was simple hypertrophy.

ART. XII.—*Case of Diphtheritic Croup, in which Laryngo-tracheotomy was performed; Death on the Seventh Day, from the Systemic Poison.*
By JOHN H. PACKARD, M. D., of Philadelphia.

THERE is perhaps no one of the diseases to which childhood is subject more generally dreaded by parents, or which the physician encounters with less hope, than pseudo-membranous croup. No one is more distressing in its phenomena, or more disheartening in its statistics. Contributions to its clinical history cannot therefore be without interest.

In the case now to be related, the affection began as an ordinary cold, assumed a threatening character on the third day of my attendance, and became hopeless on the fourth, when tracheotomy was performed. Complete relief was afforded by it to the urgent symptoms, but the child, after a respite of somewhat over six days, succumbed to the diphtheritic poison.

R. D. W., æt. 2 years and 5 months, was taken by his parents on a journey in a carriage, during the second week in October, 1869; and the weather being chilly and raw, he contracted a cold, on account of which I was called to see him on the 19th. He was a remarkably robust, well-developed child, and seemed to be labouring under nasal catarrh, with some tonsillitis. His chest was quite clear. The symptoms yielded somewhat to mild expectorants and anodynes, with castor oil, and precaution as to keeping him in a warm and moist atmosphere.

Oct. 20. His voice being somewhat hoarse, and his cough more marked, I ordered ant. et potass. tart. gr. $\frac{1}{32}$, succ. belladonnæ $\mathfrak{m}$ iv, and syr. ipecac. fʒj, every three hours. Warm baths were also given when he had paroxysms of dyspnœa, or about thrice daily.

21st. The breathing was more oppressed, and the voice persistently hoarse, with occasional stridulous cough; and this condition becoming more pronounced, Dr. J. F. Meigs saw him with me in the evening. The left nostril was now lined with a yellow deposit of false membrane, and on the upper edge of the left tonsil there was a firm gray patch.

22d, A. M. A somewhat copious epistaxis occurred from the right nostril; otherwise the symptoms were unchanged. Treatment continued until evening, with the addition only of an emetic of alum and syrup of squill, to be given along with the warm bath when the paroxysms came on. At this time his condition was alarming, from extreme dyspnœa. He lay in a drowsy state, with gasping and stridulous respiration, and marked recession of the base of the chest at the end of each respiratory act. His voice was gone; but his pulse was good, and his strength seemed undiminished, although for two days he had taken scarcely any nourishment.

Believing that his only chance lay in the performance of tracheotomy, we asked the counsel and assistance of Dr. Brinton; and after fully discussing the subject, and informing the parents of the difficulties and dangers attending even this course, we decided upon attempting the operation. In arriving at this conclusion, we did not overlook the fact of the diphtheritic character of the exudation, as shown by its appearance in the left nostril; but regarded this as influencing rather the prognosis than the therapeutic

indications. The subsequent history of the case will show the correctness of such a view.

Accordingly, at 10.30 P. M., the child was placed upon a table covered with folded blankets, and chloroform given by Dr. W. Sinkler. (I was unwilling to use ether, on account of its inflammability.) An incision about an inch and a half in length was made in the median line, and the tissues cautiously divided with the edge of the knife until the interval between the sterno-hyoid muscles was reached, when the handle, the finger, and the forceps were used in working down so as to expose the trachea. Twice we met with a smart gush of blood; first at the lower part of the wound, when it was arrested by ligation, and afterwards at the upper part, when a spring-forceps was effectively applied. Finally, having inserted a tenaculum through the anterior wall, I drew the trachea forwards, and with a sharp-pointed knife punctured the crico-thyroid membrane; then, introducing a probe-pointed bistoury, I divided the cricoid cartilage and the two upper rings of the trachea. At the third attempt, I introduced the ordinary double canula, which was at once secured with tapes in the usual way.

The operation, which occupied about an hour and a half, was extremely difficult, the neck being very short and plump, and the trachea lying very deep and excessively mobile. It was immediately followed by great relief to the breathing, and the child soon fell into a calm and natural sleep. He was induced to swallow from time to time, in small quantities, during the night, about six fluidounces of sweetened milk and water.

23d, A. M. Patient's condition very good; respiration well performed, and generally not more than 40 in the minute, sometimes falling as low as 28; pulse about 130. But he showed a great aversion to food, and could only be induced to take beef-tea by stratagem; water he took eagerly. Very little trouble was experienced in keeping the tube clear. Lime-water was atomized, warm, through the canula, every hour, and the air of the room was kept thoroughly moist by boiling water. A temperature of 72° Fahr. was steadily maintained. Drs. Horace Williams and J. G. Richardson watched the case most assiduously and skilfully from this time, with Dr. Sinkler, who attended through the night.

The following notes, taken by Dr. Richardson, give an accurate record of the progress of the case:—

"3½ P. M. Patient lying upon the operating-table, apparently free from pain, amusing himself with his handkerchief, nurse's ear-rings, &c. Respiration but little embarrassed, and performed through the canula; it varied from 34 to 48 per minute, according as the tube was coated with inspissated mucus or had been recently cleansed, an operation required about once in two hours. Pulse during sleep 128, force and volume good; skin moist, but rather warm; tongue slightly furred; bowels open; urine, which was passed in bed, apparently normal. Swelling of the neck very slight; no uneasiness from the wound. He refused food, but eagerly swallowed a few spoonfuls of water from time to time.

"During the night he had six evacuations from the bowels, but at 9 A. M., Oct. 24, neither his pulse nor his general appearance showed greater debility. Respiration and heart's action as yesterday. At 11 A. M., in a paroxysm of coughing, he expelled through the tube a piece of false membrane. Bowels moved three times up to 3 o'clock.

"25th. Pulse and respiration good; each had apparently decreased on the average, as while sleeping quietly soon after the tube had been cleansed at

1 P. M., they were 112 and 29 respectively. During the day, from 9 until 3, his bowels were moved four times, and two pieces of false membrane were coughed up. The inhalation of the vapour from slaking lime was administered every hour, being found preferable to the steam and hand ball atomizers, both of which had been tried. Atmosphere of the chamber was kept quite moist. During the day he took about one-third of a teacupful of beef-tea, but without relish.

"26th. A good deal of swelling about the wound, and several vesications filled with yellow serum; a zone of erythematous redness extending for about an inch beyond the margin of the blistered surface. Pulse and respiration as yesterday; the bowels continue loose; tongue not quite so much furred; and at 11 A. M. he ate half the yolk of an egg with less disgust than he had previously shown for food. Pulse 36, respiration 120. The lime inhalations and the moist atmosphere maintained.

"27th, 11 A. M. The inner canula twice removed and cleaned (a dark adhesive mucus being extracted), after which patient fell into a tranquil sleep, which continued for an hour. Pulse 116, soft, regular, of good volume; respiration 28, easy and unembarrassed.

"28th, 12 M. After a sleep of half an hour, previous to which the inner tube of the canula had been removed and cleansed, his respirations were 40; pulse 124. As compared with the day before, the radial beat seemed to be a little sharper, more hurried, and to have a slight tendency to irregularity of rhythm. Endeavoured to auscultate the patient, but the transmitted râles from the tracheotomy-tube, coupled with extreme intolerance of the slightest touch, prevented any satisfactory examination. Dark, reddish-brown mucus collecting in the canula, much more abundantly than during previous twenty-four hours; a constant free discharge of reddish saliva and nasal mucus. Erythematous redness not more extended than the day before, and not quite so bright in colour. No air could be detected passing through the nasal or oral apertures."

Evening. Although the patient had no increase of embarrassment in breathing, his condition did not seem so favourable. There was a much darker colour, and more tendency to the exudation of bloody sanies over the skin about the tracheal opening; and his restlessness was greater. This restlessness had been constantly noticed by Dr. Sinkler in a very marked degree at night; the child would clap his hands, roll his head, or swing one leg over the edge of the table, uncontrollably.

29th, 1 A. M. Had a sudden attack of prostration, with failure of pulse, clamminess of surface, and great rapidity of breathing. Under active stimulation he rallied somewhat, but the symptoms returned at about half-past six. Death took place at about 7.30 A. M., six days and seven hours after the operation.

Autopsy, made by Dr. W. Sinkler ten hours after death.—Skin of the front of the neck, and especially around the opening into the trachea, of a deep purplish-red colour; much of the cuticle had peeled off during the last day or two of life, leaving sloughy ulcers. Upper part of neck, and parotid region, especially of the right side, swollen. A subcutaneous abscess was opened into just below the tracheal orifice, containing half a fluidrachm of healthy pus. Mucous membrane of the trachea universally congested and softened; no mark of pressure by the inner end of the tube. Softening and congestion, producing a brownish-red colour, extended up into the larynx, which contained no sign of false membrane; it existed also in a very marked degree throughout the air-tubes of the right lung, which

were full of bloody and frothy mucus. Right pleural cavity contained some serum; lung on this side congested posteriorly and near its apex. At this latter point (near the apex of the right lung) there was a very deep focus of congestion, with actual effusion of a clot of blood. A section sank in water. On microscopic examination, by Dr. Richardson, of a small portion "with a power of 1200 diameters, the air-vesicles were found to be generally filled but not distended with red and white blood-corpuscles in about equal proportions, with a considerable amount of granular matter; the condition was quite distinct from collapse of the lung, and, I have no doubt, constituted an early stage of the red hepatization of pneumonia." Other apoplectic foci, of less size and distinctness, existed at one or two spots in the neighbourhood of this principal one. Left lung entirely healthy, although the mucous membrane of the air-tubes presented the same dusky congestion as those on the right side, but in less degree.

A day or two before the child died, his father became affected with diphtheria, and had copious exudation on both tonsils. The symptoms yielded readily to treatment, and in five days had altogether disappeared, leaving him in his usual health.

So much room has been taken up with the account of this case, that I shall offer only a few brief comments upon it.

1. As to the value of the operation. Difficult and dangerous as this was, it completely relieved the intensely painful dyspnoea, which would undoubtedly have proved fatal in less than twenty-four hours. Both to the child himself and to his parents a great deal of suffering was thus saved; six days of comfort were secured to him, and his death, when it occurred, was comparatively quiet and easy. Hence, even as a merely euthanasial means, the value of the operation can scarcely be overestimated; while the survivors have the sad satisfaction of knowing that no chance was neglected in the case.

2. As to the difficulties of the operation. These, as before mentioned, were very great. Perhaps nothing but actual experience can convey an idea of these difficulties, or of the horrors of death on the operating-table, which might so readily occur in a case of the kind. And yet tracheotomy is often spoken of as one of the "medical operations." Of course in many instances it is far easier than in the one now related; but the statement of Trousseau,¹ that it "is in itself an operation which is more delicate than difficult," is certainly not of universal application, since this is the fourth case of great difficulty which has come under my own observation.

3. As to the cause of death. It is a very common opinion that the existence of false membrane in the trachea or bronchi is a strong contra-indication to operating, and that its absence is in favour of success. Yet, in the case now detailed, there was no such deposit found anywhere in the air-passages after death, although some casts were coughed up within the

¹ Memoirs on Diphtheria, published by the New Sydenham Society in 1859, p. 244.

first three days. The child died from blood-poisoning; all that could be gained by the operation was gained.

On the other hand, in several successful cases of which I have had knowledge, large casts of false membrane have been ejected through the tube.

The abundant literature of the whole subject of croup is so generally accessible, that it is unnecessary to do more than offer this clinical history.

1415 SPRUCE STREET, PHILADELPHIA, NOV. 13, 1869.

ART. XIII.—*Cases of Ovariectomy.* By WASHINGTON L. ATLEE, M. D., of Philadelphia. (Reported by Dr. J. EWING MEARS.)

IN accordance with the plan adopted by Mr. T. Spencer Wells, of London, in the *Medical Times and Gazette*, and by Mr. Thomas Keith, of Edinburgh, in the *Edinburgh Medical Journal*, we propose to report the cases of ovariectomy occurring in the practice of Dr. Washington L. Atlee, commencing with reports of his third centenary of cases. In beginning reports of his cases at this period of his operations, it will be of interest to premise that the mortality in the two hundred preceding cases has been about thirty per cent.; it is impossible to state it more accurately, by reason of the fact that the cases have never been tabulated. This percentage of mortality corresponds very nearly with that of European ovariectomists, and must be regarded, in view of the circumstances which in this country, in many instances, surround the cases, as extremely favourable. The method of operation employed by Dr. Atlee is that designated as the "minor operation," characterized by the small extent of the incision in the abdominal walls, and the reduction in size of the cyst by the evacuation of its contents prior to extraction.

In the treatment of the pedicle he uses the clamp, his experience having led him to believe that it is the best means suggested.

As an anæsthetic agent he administers a combination of chloroform and ether, in the proportion of one part of the former to two parts of the latter, liquid measure. This he finds an effective combination in the production of anæsthesia, safe in its administration, and less liable to provoke nausea and vomiting than either agent uncombined.

In the deligation of bleeding vessels he uses the hempen thread ligature. The incision is closed by iron wire interrupted sutures. In operating he stands upon the right side of the patient.

CASE 201. *Operation April 14, 1869; polycystic ovarian tumour, weighing about sixty pounds; extensive adhesions; patient tapped fourteen times, and greatly emaciated and enfeebled; incision seven inches long; recovery.*—Mrs. E. C., aged 59 years, widow, resident of Baltimore,

has been afflicted with the disease, she thinks, over twenty years. Menstruation commenced at the age of $14\frac{1}{2}$ years, and continued to be regular until the age of 43; then becoming irregular, it ceased at 45. She was married at the age of 27; one year after she had one child, and three years after she had a forced miscarriage at five months' gestation.

During the period of time embraced between February 17, 1850, and July 4, 1868, she was tapped fourteen times. The fluid removed by the first tapping was straw-coloured; that by the third was of a transparent opalescent colour, uncoagulable by heat, and contained flakes of lymph. At the twelfth tapping the fluid was of a dirty green colour, and also contained flakes of lymph. At the last tapping the trocar was entered below and then above the umbilicus, no fluid escaping from the puncture below; a bloody fluid was drawn away from the puncture above.

The patient was first seen by Dr. Atlee in consultation with Dr. O'Donnell, of Baltimore, August 11, 1855. All the characteristic features of a monocyst were present, and her health good. This diagnosis was confirmed by second examination, October 25, 1858.

March 17, 1869, the patient was again seen by Dr. A., at which time she was immensely large, greatly emaciated, enfeebled, and very solicitous of relief. The whole right side was occupied by an immense cyst, easily fluctuated, while in a corresponding position in the left side was an equally large solid mass, evidently polycystic—the linea alba being the dividing line. The pelvis was free, and the uterus small and movable. The umbilicus bulged out as large as a small foetal head, and was translucent with fluid.

April 14, 1869, ovariectomy was performed, Drs. Warren, Scott, Powell, and other physicians being present. The operation was greatly complicated by extensive visceral and parietal adhesions, the separation of which provoked much venous bleeding; these bleeding vessels were secured by separate ligatures, the ends being brought out at the middle of the incision. The whole anterior surface of the tumour was adherent to the abdominal wall; there were also strong bands connecting the tumour with the fundus of the bladder and portions of the intestines. The pedicle was thick, broad, and vascular, and was secured by the clamp, a ligature having been first thrown around it, to reduce its size. The initial incision of three inches was enlarged above and below until it measured seven, in order to remove the tumour, which was polycystic, and involved the right ovary, the left being healthy. Estimated weight of tumour was sixty pounds.

The patient bore the operation well, the pulse being well maintained, and no vomiting occurring. Recovery took place without any unfavourable symptoms.

Remarks.—Several points in this most interesting case are worthy of remark, and from which valuable practical inferences may be drawn. In the early period of its history it was a unilocular cyst, occupied by a non-coagulable fluid, reaccumulating very slowly, making no drain upon the general system, not impairing the functions of life, and not affecting strength and health. I saw her in 1855, and accomplished the third tapping. Instead of stopping there, I ought to have removed the cyst. Or what, perhaps, would have been less hazardous, but quite as successful, I ought at least, in an uncoagulable fluid like this, have drawn out a portion of the cyst, cut it off, and returned the rest. By this means the fluid

secreted by the interior of the cyst escapes into the cavity of the peritoneum as fast as it is secreted, and is there taken up by the absorbents. This is my plan now with those thin peritoneal cysts which spring from the broad ligament, and are filled by an uncoagulable fluid resembling spring water in colour and transparency, and containing only a trace of chloride of sodium. The chances of life, at this early period, were very much in her favour, and the operation would have afforded her fourteen years more of a more comfortable existence.

A similar condition of things continued until the eleventh tapping, with the exception that paracentesis had to be performed at shorter intervals. Following this tapping there was acute inflammation of the ovary itself, and of the peritoneum, and rapid impairment of the vital powers. The whole aspect of things was changed. The twelfth tapping drew off a large quantity of fluid; the first bucketful being a *dirty green, and full of lymph*; the second was *stringy andropy*. At the thirteenth tapping the fluid was *opaque and of a dirty white colour* in one cyst, while in another that was opened there oozed out a *thick* substance. At this tapping a large lump was first discovered in the groin. The development of more solid matter now became rapid, so that at the last tapping no fluid could be extracted below the umbilicus; and when I saw her in March, 1869, the whole left side was enormously enlarged by a solid mass. This, with the great emaciation and cachectic condition of the patient, caused the most distinguished surgeons of Baltimore to come to the natural conclusion that the patient was beyond surgical relief.

In discussing the question of ovariectomy, the cases ought to be arranged into two classes: 1st, patients who are in a condition favourable for any grave surgical operation; and 2d, those whose powers of life are rapidly failing, and the operation is undertaken with the hope of diminishing impending danger.

To the second class belongs the above case. It was a brand plucked from the fire and saved. Such a result, and the same has occurred in repeated like instances, authorizes the surgeon to lend his aid to these desperate cases; and although they greatly diminish the favourable statistics of ovariectomy, yet, in my opinion, they are the strongest arguments to justify the operation.

CASE 202. Operation, April 20th, 1869; *polycystic ovarian tumour; adhesions; never tapped; incision about six inches long; recovery.*—Mrs. R., of North Carolina, married, æt. 29; never conceived; health pretty good; consulted Dr. Atlee, Dec. 21, 1868. She first noticed the tumour in the right side when about the size of a duck's egg. It was quite movable. When recumbent on the back, and the abdomen exposed, no enlargement is perceptible. By palpation a soft, elastic, oblong, cystic tumour can be felt occupying the right side, reaching up as high as the umbilicus, and towards the left as far as the linea alba. It is perfectly movable in all directions, even into the left side. It cannot be elevated to

the same extent, appearing to be retained by a short pedicle. The pelvis is free, the uterus central, the sound enters only $1\frac{1}{2}$ inches. Motion given to the tumour does not affect the sound, except when raised.

Diagnosis.—Tumour of the right ovary. Declined operating on her at this early stage of the disease.

From this time until March 31, 1869, the tumour continued to increase in size, and the patient became very much enfeebled by severe pains in all parts of the person, consequent loss of sleep, and weak appetite.

April 20, 1869. Dr. Atlee visited Raleigh, and found that there had been a rapid increase in size and a great change in the character of the tumour. The patient was now larger than a woman at full term, the tumour multilocular and occupying the whole abdomen, and in consequence of the frequent attacks of inflammation numerous adhesions have been established.

20th. Ovariectomy was performed, Drs. E. Burke Haywood, Hill, C. E. Johnson, and other physicians being present. The usual anæsthetic was employed, and an incision three inches in length was made in the linea alba. The large cyst, containing two quarts of yellow transparent adhesive fluid was evacuated, and also several smaller cysts containing a more opaque and darker fluid—some a thick cheesy matter, others a pus-like jelly, and others a white ropy substance. The adhesions were omental and intestinal in character, and were not very strong. The pedicle was membranous, measuring six inches in width. It was condensed by a ligature and secured by the clamp. The incision, enlarged to six inches, was closed by eight wire sutures. There was but little hemorrhage, and no vessels required ligation. The tumour was polycystic, and consisted of the right ovary—the left was healthy. There was no vomiting during the operation, the anæsthetic being well borne. With the exception of slight nausea for two days following the operation, the patient recovered without an untoward symptom—the wound healed by first intention.

Remarks.—The above case was one of very rapid development, and, although death was by no means impending, would most probably have reached a fatal termination in a very few months. It belongs to the first class of cases, but was rapidly running into the second. On visiting Raleigh, and seeing the patient's unfavourable condition, I censured myself for not having operated when she was in Philadelphia, as the chances of life were then infinitely better, and several months of severe suffering would have been saved. My rule has always been not to operate in the early period of ovarian tumour, and where the health has not been impaired, with the hope that the disease, as in some instances, may remain stationary, and that the sensitiveness of the peritoneum may be diminished by pressure and attrition. This, I think, is a judicious course, when the patient is constantly under our own supervision, as thus we are able to act whenever it may become necessary. But in regard to distant patients, I am not satisfied that it is best.

CASE 203. Double Ovariectomy. Operation May 12th, 1869. Polycystic ovarian tumour; extensive adhesions; never tapped; incision about seven inches; death on the fifth day.—August 14, 1868, Mrs. J. M'G. consulted Dr. Atlee. She is æt. 36, a native of Ireland, but residing in

this city. First menstruated between 17 and 18 years of age, and has always been regular. When 27 years old she was married and had four children, the youngest being five weeks old. When pregnant the last time she was unusually large, so that twins were expected. She thinks she felt the motions of the child on the left side. However, it is well-known that statements by this class of patients are not reliable. The left leg also swelled, but this swelling left her before the child was born. After the parturition the abdomen continued to be large. She is now as large as a woman at seven months. All the characteristics of a multilocular tumour exists. The tumour is central, elastic, pretty uniform in shape, and non-fluctuating. The uterus is thrown back. The sound was not used.

Jan. 26, 1869. Patient called again. Her condition has greatly changed. The whole right side is bulged out irregularly by a polycystic mass. The left side is occupied by another mass in which one large cyst is embraced. Resonance on percussion only manifest in the epigastrium. and left hypochondrium. Fluctuation discoverable in several of the cysts. Hard points can be discovered in the divisions between the cysts. She now stated that the tumour was first discovered four months before the birth of the child, which was on the 9th of July. No difficulty in parturition. Menstruation returned last week.

May 2. As Mrs. M'G. is anxious for an operation, Dr. A. called at her home to make a more careful examination. She has rapidly increased in size, now being very much larger than a woman at full period. The only resonance on percussion is in the left part of the epigastrium, in an angle formed by an indentation in the tumour, and this resonance exists only when the patient is on her back.

Ovariectomy performed May 12, 1869. Doctors John L. Atlee, Sr., of Lancaster, Pa., Thompson, of Paducah, Ky., F. S. Newcomer, of Indianapolis, Ind., A. M. Owen, of Chester, Pa., Egbert, U. S. N., Drysdale, Keen, Mears, Hoffman, W. F. Atlee, Stewart, attending physician, and other physicians were present. The patient having been anæsthetized, an incision four inches in length was made in the linea alba down to the tumour. An attempt to evacuate the large cyst through the canula of the large trocar failed by reason of the density of the fluid, which was very thick, opaque, ropy, brownish-coloured, and was loaded with large masses of fibrinous-like deposits. The wall of the presenting cyst was incised and the fluid removed. The hand was then introduced into the cavity of the large cyst, the incision in the linea alba having been enlarged to the extent of seven inches, and the smaller cysts were broken up and their contents removed. The anterior surface of the sac was closely adherent to the omentum, which spread over it in a fan-shaped manner, and was very much thickened and vascular; intestinal adhesions existed at various points; on the left side a coil of intestine measuring about six inches in linear length was so firmly attached to the wall of the tumour that this portion of the cyst was dissected out, and allowed to remain in contact with the intestine.

The pedicle was six inches in width, very thick, and embraced the right side of the fundus uteri. Owing to its size it was divided, and secured by two clamps. The left ovary was found to have undergone cystic degeneration, being about the size of an English walnut. It was removed, the pedicle being secured by a ligature, returned to the pelvic cavity, the end of the ligature kept outside. The lacerated portions of the omentum were separated into three fasciculi, and after being retrenched freely surrounded by ligatures, and the stumps secured in the track of the incision

by suture pins; the incision was closed by five wire sutures. Patient bore the operation well, and reacted perfectly. No vomiting during the operation, and but little subsequently. Death occurred on the fifth day. No decided evidences of inflammation or symptoms of pyemia were present. *Post-mortem* examination was not permitted. The estimated weight of the tumour was thirty-five pounds.

CASE 204. *Operation June 7th, 1869; polycystic ovarian tumour; no adhesions; tapped once; incision five inches long; recovery.*—June 19, 1868, in consultation with Dr. Keating Dr. Atlee visited Miss D., of this city. She had always enjoyed good health; æt. about 40, and has always been regular. About one year ago, while engaged nursing a relative, she felt as if something suddenly gave way in the right groin, after which she began to enlarge, and has continued to increase regularly in size, particularly during the last two months. She is quite as large as a woman at full period. The enlargement is uniform, roundish, soft, and elastic, free from ridges and nodules, and fluctuates as if the fluid was dense and thick. The pelvis is filled up with an elastic body which has pushed the uterus up out of the pelvis above the symphysis pubis, so that the finger can scarcely reach the os, while the body of the uterus can be detected by the hand outside, occupying an oblique position to the right of the linea alba. The pelvic tumour is evidently a projection of the abdominal. *Diagnosis*; tumour ovarian, and tapping is recommended in order to decide upon the propriety of an operation.

June 27. In company with Drs. William V. Keating and S. Weir Mitchell, Dr. A. tapped the patient of two or three gallons of deep yellow transparent fluid, loaded abundantly with cholesterine, and which by heat proved to be albuminous. The fluid did not escape readily, but towards the last had to be aided by the sound through the canula. After drawing off all the fluid, the abdomen was surveyed by the sound before removing the canula. Behind the cyst tapped the sound detected another cyst-like body, and the abdomen continued to remain prominent. This was partly owing to the adipose walls, but still back of that a mass could be felt, resembling a soft multilocular tumour. The pelvis was still occupied as before, and the uterus elevated, and it could now be more distinctly traced to the right of the linea alba.

A specimen of the fluid was subjected to microscopical examination by Dr. W. W. Keen, and decided to be ovarian. It contained large flakes of the compound granular corpuscles, with masses of cholesterine plates, and also very numerous oil granules and globules. Fatty degeneration was very active.

June 7, 1869. Ovariectomy was performed, the following gentlemen being present: Drs. Keating, Burpee, Drysdale, and Addinell Hewson. No adhesions existed, and the tumour, multilocular in character, was removed through an incision five inches in length. Two cysts were firmly impacted in the pelvic cavity. The pedicle, small and of good length, was secured by the clamp. The tumour consisted of the left ovary, and was composed of four cysts, one large and three small ones. Weight of tumour about thirty pounds. The fluid was amber-coloured. The patient recovered without any prominent symptoms requiring attention.

ART. XIV.—*Two Cases of Growth of the Aspergillus Fungus in the External Auditory Canal.* By D. B. ST. JOHN ROOSA, M. D., Clinical Professor of the Diseases of the Eye and Ear in the University of the City of New York, Surgeon to the Brooklyn and Manhattan Eye and Ear Hospitals. With a Microscopical Description by WILLIAM B. LEWIS, M. D., Lecturer in the University, Microscopist to Charity Hospital.

CASE I. June 30, 1869, I was consulted by J. F. B., a gentleman æt. 24, in regard to pain and impairment of hearing in the left ear. He stated that about a year before he had experienced a sense of fulness in the ear, as if it were "stopped up," and that at the same time there was considerable tinnitus aurium. He consulted a physician who diagnosticated inspissated cerumen, and removed a large quantity of what seemed to be ear-wax from the canal. The relief afforded was of short duration, for the ear was soon filled up. From that time to the present the patient has been in the habit of syringing the ear, and at times masses of some foreign substance were removed by this process. Of late he has noticed black particles strewn in the substance removed, which he thinks are due to the entrance of dust from the smoke-pipe of a steamer during a recent voyage from Europe. The patient now experiences very considerable pain in the ear, and it is the occurrence of this new symptom which has led him to consult me. The other symptoms—the sensation of fulness, tinnitus aurium, and impaired hearing continue. Patient's general health is good, though he is very subject to naso-pharyngeal catarrh.

On examination of the patient, a watch, which is usually heard at least thirty inches from the auricle, is only heard one and a half inches, and the auditory canal is filled with a lardaceous mass, punctated by minute black spots. This mass was very adherent to the walls of the canal, and could not be thoroughly removed by syringing; but required the use of the angular forceps under a good illumination by means of Troltsch's otoscope and ordinary daylight. The surface beneath this mass, which peeled off from the canal, was red and very sensitive. After the removal of the foreign substance, a minute perforation of the membrana tympani was found situated in the anterior and inferior quadrant. There was no true suppuration, but mucus alone bubbled out from the opening during the inflation of the Eustachian tube. The Eustachian tube was shown to be permeable by Politzer's method, but there was very little sensation experienced in the ear when the air was forced in.

On the removal of the collection, the patient experienced immediate relief from the pain and tinnitus aurium, but the hearing was not very much improved. The diagnosis *catarrh of the middle ear* was made, while an exact definition of the state of things in the canal was delayed. Portions of the lardaceous flaky substance removed from the canal were placed in glycerine.

He was ordered injections of warm water by means of Clarke's aural douche (an adaptation to the ear of Weber's nasal douche) several times daily, and to drop in a solution of zinc. sulph. gr. ij ad aqua ʒj twice a day. The Eustachian catheter was used and air injected through it into the cavity of the tympanum.

It was some days before the entire collection was fully removed, and in

spots where it had been separated and taken out it was renewed very rapidly, and each time reproduced the symptoms of pain and fullness. A weak solution of carbolic acid was then used, but it caused very great irritation, and inflammation was set up, which lasted some days. This was treated by the use of warm water through the douche. When it had subsided the lardaceous masses were removed by the forceps, and in some instances casts of the membrana tympani came away, although the walls of the canal showed the most disposition to a reproduction of the growth.

July 27 the opening in the membrana tympani had healed, and the hearing so much improved, that the watch was heard six inches and the symptoms completely relieved. There was still a slight tendency to the growth of the fungus, as it proved to be, on the posterior wall of the canal. The membrana tympani was lustreless and rigid, the handle of the malleus distinct, but there was no light spot. From the 1st of August I did not again see my patient until October 18. Meanwhile he had used the aural douche daily, and the growth had not returned, but the catarrhal inflammation of the middle ear had not been materially benefited, as shown by the rigidity of the membrana tympani and the impairment of hearing. The membrane is now (November 19) somewhat translucent, and the patient is being treated with benefit by means of the injection of air, the use of a gargle, etc., for the middle ear affection.

The flakes preserved in glycerine were examined by my friend Dr. C. E. Hackley and myself under the microscope, and Dr. Hackley believed them to exhibit specimens of *aspergillus nigricans*. At a later date Dr. William B. Lewis very kindly made a thorough examination and confirmed Dr. Hackley's opinion. The results of Dr. Lewis's labours are appended to this paper, and to them must be ascribed most of the value that may be attached to it.

CASE II. Sept. 28, 1869, I was consulted by Mr. S., æt. 51, on account of impaired hearing, vertigo, pain in the ears, and tinnitus aurium. Vertigo was the symptom upon which the patient laid the most stress, and of which he was most anxious to be relieved. He said that he was so dizzy whenever he attempted to walk about, as to be unable to attend to his ordinary business. His condition in other respects was excellent. Patient stated he had heard perfectly well until two months since, when he was attacked with the aural symptoms narrated above, which had been aggravated since their inception. He had been treated by the instillation of oils and so on. He could hear my watch about one inch on the right side, and not at all on the other. Both auditory canals were found filled with a tenacious material, which could only be removed by the forceps. It was several days before I could completely remove the firmly adherent coating of the canal and membrana tympani.

The morbid product was immediately examined by Dr. Lewis, and found to be a specimen of the *aspergillus flavescens*. Its removal gave the patient great relief, but on the reappearance of the growth, which was in two or three days after its thorough removal, the vertigo and tinnitus returned. The membrana tympani was intact, but lustreless and rigid. The Eustachian tubes opened sluggishly, and there was all the evidence of aural catarrh, besides the affection of the canal and of the outer layer of the membrane of the tympanum. The free use of warm water, with an astringent, finally subdued the morbid process in the canal, so that the patient was able to make a journey to the South. When he left my care, Oct. 18, the auditory canals were entirely free from abnormal secretion,

the hearing was improved so that the watch was heard from five to six inches on the right side, and from one to two on the left. The dizziness was entirely gone, and the tinnitus ceased to be annoying. The catarrh of the inside ear, as shown by rigidity of the membrana tympani, sluggish action of the tubes and impairment of hearing, still continued.

Remarks.—The history of the growth of the aspergillus fungus is so recent that I may be allowed to recapitulate it before passing on to some remarks on the foregoing cases. In 1867, Professor H. Schwartze, of Halle,¹ reported a case of inflammation of the canal caused by this fungus as shown by the microscopic examination of Professor Vogel. According to Schwartze, Mayer, in 1844,² had reported a similar case, as well as Pacini in 1851, reference to which case is made by Kuchenmeister, in his work on parasites. Schwartze remarks that there must be an appropriate place prepared for the growth of this fungus in the auditory canal, and he supposes that an exudative inflammation, or at least a loosening and softening of the epidermis precedes the growth.

Dr. Robert Wreden, of St. Petersburg,³ in the following year reported six cases, and he gave the name of *myringomykosis* to the disease caused by the fungus. He subsequently added eight cases to these, and published the whole, with a very complete account of the appearance of the aspergillus, in a monograph.⁴

Dr. J. Orne Green, of Boston, has also published two cases in the *Boston Medical and Surgical Journal*, and he read the history of another at the last meeting of the American Otological Society, which will appear in the transactions of that body for 1869. A very few other cases have been reported in Germany, in the *Monatsschrift für Ohrenheilkunde*, but to Schwartze belongs the credit of having awakened an interest in the study of a fungus, the existence of which had before received a passing notice merely.⁵

There is hardly a doubt but that an affection of the ear caused by the aspergillus has existed for a long time, if not always, but it has not been recognized for the simple reason that diseases of the ear have been until within a few years very much neglected except by isolated practitioners. Since my attention has been turned to the subject, I recall two very obstinate cases of inflammation of the auditory canal, which I believe were subjects of the aspergillus growth. It is interesting to state that they both recovered without any use of parasitocides.

The subjective symptoms of the growth of aspergillus in the auditory canal are very similar to those from impacted wax. There is a sensation

¹ Archiv für Ohrenheilkunde, Band II. p. 9.

² Muller's Archiv, 1844, p. 401.

³ Archiv für Ohrenheilkunde, Bd. III. p. 1.

⁴ Die Myringomykosis Aspergillina.

⁵ Robin's cases so largely quoted in recent American and English journals, were merely reports of those observed by Wreden.

of fulness, tinnitus aurium, vertigo, pain, and impairment of hearing. As is well known, pain is not one of the common symptoms of inspissated cerumen, although it does occur, but it seems to be of the presence of *aspergillus*. This may be due to what Schwartze and Wreden are inclined to think is a fact, that is, that an inflammatory action always precedes the growth of the plant, which thus has a field prepared for it.

The objective appearances consist in the adherence of flakes or scales, of what may be mistaken for epidermis, on the walls of the canal and the outer surface of the *membrana tympani*. Sometimes this whitish adherent material nearly fills the canal. It can scarcely be removed by the use of a syringe, but forceps employed under a good illumination are required to detach them. In the variety known as *aspergillus nigricans*, little black points are seen in the mass. On removal of the fungus the integument beneath is found reddened and sensitive, and in a very few hours the growth has reproduced itself. The aid of the microscope must of course be called in to make the diagnosis sure.

The etiology of the affection is not quite clear. Wreden agrees with Schwartze in believing that a precedent inflammation has furnished a proper field for the growth of the parasite. In my own cases I think it probable, judging from the history, that the patients suffered from aural inflammation before any growth of *aspergillus* occurred, but that it was the troublesome symptoms caused by the growth of the fungus which led them to seek medical aid. The *aspergillus*, according to Wreden, like the *pencillium*, is found as the mould of damp, or rather unventilated rooms. As we should expect, the habits of the Russians, living as they are almost compelled to in badly ventilated rooms during the long winter, are very favourable to the production of the *aspergillus*. It is still undecided why the *aspergillus* should be found in the ear, while the mould which is found with it in the air of a room, the *pencillium*, does not invade this part. It should be stated that the *aspergillus nigricans* and *flavescens* are but varieties of *aspergillus glaucus*. It is probably the fructification or growth of the fungus which causes the pain and vertigo so often attending the presence of the parasite.

Professor William H. Draper, M.D., of this city, as I learned from him by a verbal communication, saw a case of *aspergillus* growth on the inner side of the thigh, and the fungus afterwards appeared in the auditory canal. It is reasonable to suppose that other parts of the integument besides that of the lining meatus auditorius may be subject to the invasion of the parasite.

The treatment of the affection is very simple, although it requires some patience and care. The surgeon must attend to it himself, and not leave it to the hands of the patient or his friends. It is impossible for any one who is not able to examine the *membrana tympani* to be sure that the passage leading to it, as well as the membrane itself, is entirely free from the fungus, even after the most thorough syringing. It need

hardly be said that the thorough removal of any morbid growth or secretion is essential to any treatment of the diseased structure upon which it forms. The aspergillus growth then should be carefully removed, and afterwards the canal be kept clean by the use of warm water, which if persistently used, will soon prevent a reproduction of the plant.

Wreden thinks that the use of a parasiticide is necessary to prevent the growth of the fungus. From my own very limited experience, and from that of Dr. Green, of Boston, who has observed three cases, and Dr. Knapp, of New York, who has observed one, I think no such agent is necessary, but that the thorough and repeated removal with the use of water is sufficient to kill the growth. In the Monograph of Wreden a long list of agents is given, which may be found useful. Some of these are alcohol, bichloride of mercury, acetate of lead, tincture of iodine, and carbolic acid. He gives the preference, however, to the hypochlorate of lime (*calcaria hypochlorosa*), which he recommends to be used of the strength of one to two grains to the ounce of water. The salt must be freshly dissolved in water at each application. Fowler's solution ranks next to the lime as a parasiticide, according to Wreden.

Botanical and Microscopical Description.—The information with regard to the microscopic structure of the aspergillus available to the general practitioner, in the English language, is exceedingly meagre. Beale¹ gives an illustration of the vegetating portion, the mycelium, of a fungus of this name, and in the few lines of text devoted to the subject mentions that "many filaments contained a receptacle filled with spores." He, therefore, furnishes no means of diagnosis, since it is notoriously the case that the mycelia of different species of these low organisms often have no certain characters by which they may be distinguished one from the other. But, more than this, his language is calculated to mislead the novice in medical mycology. The aspergillus, as we shall see, does not present receptacles "filled with spores," but, on the contrary, receptacles *covered* with spores. The ear is, it seems, at times invaded by a fungus of the character given by Dr. Beale, the ascophora or mucor, otherwise known also as the bread-mould. May it not be possible, therefore, that the growth which Dr. Beale had under observation was an ascophora instead of an aspergillus? Dr. Geo. Harley,² in the work edited by G. T. Brown, M. R. C. S., correctly represents the aspergillus, and barely mentions it as existing in the nail and ear without further attempt at description. Other medical writers have quoted these authorities, but there is nowhere to be found a satisfactory account of the appearances and varieties of the plant. We may be pardoned, then, for entering upon a somewhat detailed description of the aspergillus, since Wreden has lately much enlarged

¹ The Microscope in Practical Medicine, 1867, p. 278.

² Histological Demonstrations, 1866, p. 254.

our knowledge in this direction. It happens very fortunately that our first cases have furnished the only two varieties of the fungus at present known to invade the ear. They have supplied ample opportunities to compare the minute differences which exist, modifications which, as Wreden suggests, are not sufficiently great to mark them as specifically different from one another or from the *aspergillus glaucus*, a very common mould. In a higher order of plants they would indeed each constitute a species, but among the polymorphous fungi, since peculiarities of form are dependent upon the soil in which each grows, the *specific* distinctions of phanerogamic botany become trivial, and it is necessary to retain in one species forms which are developed according to a number of dissimilar modes of growth.¹

The two illustrations of this article were traced upon wood, by means of the camera lucida, from specimens prepared in glycerine. The lens employed is a $\frac{1}{6}$ th of Tolles, giving an amplification of 300 diameters. The tracings, however, are upon the scale of 220 diameters, since the drawing surface lay nearer to the eye than the object.

The fungus consists of three essential parts: 1st, the *mycelium*, a dense network, or pseudo-membrane, of delicate fibres which form the ground-work, or roots as it were, from which the 2d part, or *fructifying portion* (fertile hyphen), arises perpendicularly; and 3d, the *free spores*, which lie thickly strewn upon and in the mycelium.

[Fig. 1.

*Aspergillus Nigricans.* 220 diameters.

a. Mycelium fibre. *b.* Fruit-bearing fibre. *c.* Naked sporangium. *d.* Sporangium covered with basidia only. *e.* More mature sporangium bearing spores upon the basidia. *z.* Spores in a state of germination.

¹ Carpenter on the Microscope, Phil., 1856, p. 335.

Fig. 2.

*Aspergillus Flavesceus.* 220 diameters.

a. Mycelium fibre. *b.* Fruit-bearing fibre. *c.* Sporangium bearing spores upon the basidia. *g.* Basidia showing constriction preparatory to the separation of spores. *k.* Epithelium from the meatus auditorius externus.

The physiological relation of the fruitful fibres to the mycelium is not shown in the accompanying cuts, but may at once be made clear by examining a portion of common mould with a low power.

The fibres of the pseudo membrane are unfruitful, more or less branched, straight or curved, and frequently somewhat swollen at the joints. In the broader fibres transverse cell-walls are distinguished, and all, broad and narrow, contain faintly granular plasma. In the fructifying portions—the expanded heads at least—the cell wall was so much increased in thickness as to be easily measured. The breadth of the mycelium fibres was about the same in both the *aspergillus nigricans* and the *aspergillus flavesceus*, from 0.00015 to 0.0002 of an inch (0.0038 to 0.005 of a millimetre). Wreden gives from .0015 to .006 mm.

The fruit-bearing portion, or receptacular filament, is the most interesting, complex, and characteristic part of the fungus. In this and the spores which are formed upon it we find the changes of form which establish the varieties. It consists of a filament, which, especially in the *A. nigricans*, is stouter than those of the mycelium, bearing upon its summit an enlargement, the receptacle or sporangium.

In the *A. nigricans* the filamentous part is tubular, transparent, and brittle, and much larger than the mycelium fibres from which it arises. It is but slightly larger at first, but increases in diameter near its middle portion, where its walls are thrown into waves or sinuosities, and again becomes somewhat smaller as it is inserted into the spherical, or transversely oval sporangium. The walls are here double in outline, being thicker in the waved portion of the filament and in the sporangium where the increase is greatest. Transverse cell walls may occasionally be noticed in the stalked portion, and less frequently a filament may be branched bearing two or more receptacles. The colour of these parts is light-brown, easily distinguished from the yellow or greenish-yellow of the mycelium. The measurements are as follows: Diameter of the fructifying filament remote from the sporangium 0.00045 of an inch (0.0114 mm.); near the sporangium 0.0003 of an inch (0.007 mm.); diameter of sporangium 0.0015 of an inch (0.038 mm.); thickness of wall of the receptacle 0.0001 of an inch (0.0025 mm.), of the wall of the filament 0.000075 of an inch (0.0019 mm.)

The stalk of the fructifying portion of the *A. flavesceus* is flexible, and

frequently interrupted by transverse partitions into cells containing the same greenish-yellow granular plasma as the mycelium. Except near the head it is scarcely to be distinguished from the larger fibres of the pseudomembrane, but in this situation it increases in diameter, gradually expanding into a pyriform or longitudinally oval shape. The larger and more mature sporangia are nearly spherical, but the younger and smaller are oval. The double contour of the cell walls is most marked in the receptacle. The waved outline seen in the *A. nigricans* is wanting in the *A. flavescens*. The measurements of these parts are as follows: Diameter of the fructifying filament remote from the sporangium 0.0002 of an inch (0.005 mm.); near the sporangium 0.00025 of an inch (0.00635 mm.); transverse diameter of sporangium from 0.0007 to 0.0008 of an inch (0.0178 to 0.02 mm.); thickness of wall of receptacle 0.00005 of an inch (0.00127 mm.).

Young sporangia in both varieties are surmounted by a few (five to ten) elongated cells termed basidia. As the receptacles increase in age these basidia become more numerous, and finally, in the *A. nigricans*, envelop the sporangium on all sides, to the insertion of the fibre upon which it is borne. In the *A. flavescens*, however, the lower fourth or third of the sporangium is entirely nude. The basidia are the organs upon and by which the spores are formed. Near the remote end a slight circular constriction at first appears, which afterwards deepens until separation is nearly complete. Each basidium having meantime attained again rather more than its average length, a second constriction becomes apparent, and then a third and a fourth until the number of spores thus attached may reach fifteen or twenty. The first formed spores then become detached and strew the neighbourhood with brown points, the colour, in the ripest, more or less nearly approaching black. In our cases we found no very long chains attached to either variety of sporangium, probably for the reason that in the portions of *A. nigricans* examined the fungus appeared to be advanced somewhat beyond maturity, while in the *A. flavescens* it had hardly fully reached that condition. We could not satisfy ourselves that more than three or four spores were thus attached to a single basidium, in the manner, as Wreden expresses it, of a "string of pearls." The basidia were found to have very nearly the same measurement in both varieties. The length of the spore chains was greater in the *A. nigricans*; we could not feel sure that we found more than two spores upon a single basidium of the *A. flavescens*. The diameter of the heads of *A. nigricans*, including a sporangium, basidia, and spore chains, was nearly twice that of the same parts in the *A. flavescens*.

The spores of *A. nigricans*, as we found them, varied in size from slightly smaller to as much larger than those of the *A. flavescens*, which have a pretty uniform size. When, however, the spores of either variety begin to germinate they increase in diameter, their investing membrane becomes thicker, and a nucleus appears. We found spores in this condition in the *A. nigricans* only.

As to colour the spores follow the other parts of these fungi, those of the *A. nigricans* are more or less brown, while those of the other are light yellow, with, perhaps, the faintest tint of green. The former are exceedingly distinct objects when mounted in glycerin, the latter are, in some cases, rather difficult to define when similarly prepared.

The measurements of the parts last described were as follows: Basidia, in both, 0.0003 to 0.0004 of an inch (0.0076 to 0.01 mm.). Basidia and attached spores, *A. nigricans* 0.0009 of an inch (0.023 mm.); *A.*

flavescens, 0.00075 of an inch (0.019 mm.). Spores, *A. nigricans*, 0.000133 to 0.0002 of an inch (0.0034 to 0.005 mm.); *A. flavescens*, 0.00015 of an inch (0.0038 mm.). Germinating spores, in the *A. nigricans* only, 0.00025 of an inch (0.0063 mm.). Diameter of entire fructifying head, including attached spores, *A. nigricans*, 0.0032 of an inch (0.0812 mm.), *A. flavescens* 0.0018 of an inch (0.0456 mm.).

ART. XV.—*Ulceration of the Umbilicus and Strangulation of the Intestine in an Adult Female.* By T. L. OGIER, M. D., Charleston, S. C. (With a wood-cut.)

ON the 20th of December, 1868, my friend Dr. Wm. Fitch called upon me in the night, to see a case with him, requiring an immediate operation. On our way to the patient's residence, Dr. F. gave me the following account of the accident: "About two weeks ago Mrs. S. was attacked with a severe bronchial affection, which ended in pneumonia. She had an umbilical hernia of long standing, which had previously given her no trouble. She now complained of pain in that region, and the skin over the tumour was slightly ulcerated. She was directed to dress this with simple cerate, and to apply a soft compress and bandage so as to support the swelling during the efforts of coughing; but the patient was rather refractory, and neglected these precautions, not appreciating danger from this source, and anxious only about the trouble in her lungs. The cough was to-day almost incessant, and a few hours ago, in one of these violent paroxysms of coughing, the gut was suddenly forced through the umbilicus, and, by the persistence of the coughing, was protruded through the opening until thirteen inches of the intestine hung out in a loop from the umbilicus to the pubis."

On our arrival, we found the loop of intestine above described, devoid of covering (see Figure); it had ceased to be forced any further through the opening, was distended with flatus, and strangulated by pressure against the edges of the ring through which it had been forced. Vomiting, which usually attends strangulated hernia, was now very troublesome, and the matter thrown up was of a greenish-black colour, but not fecal. The loop of protruded intestine was a portion of the ileum, and was of a very dark-red colour, from obstruction of its circulation. To return the swollen gut through the same opening by which it had made its exit was impossible. I therefore passed a hernia-knife with some little difficulty between the intestine and



the ring at the upper and middle portion, and slit up the abdominal parietes about an inch and a half at that point; the gut was then pressed gradually into the abdominal cavity until every portion returned. Much difficulty was experienced in doing this, owing to the incessant coughing. After this was effected, the remains of the umbilical tumour, consisting of the skin, cellular tissue, and peritoneal lining, were pinched up so as to bring the peritoneal surfaces in contact, which were permanently kept so by the application of the quilled suture, made with pen-handles cut about five inches long. A compress of lint, dipped in a weak solution of carbolic acid, was applied over the wound, and a doubled rag, dipped in the same solution, applied over the whole, and confined in place by the ordinary abdominal bandage. Half a grain of morphia was administered, and the patient left to rest, with directions to repeat the anodyne in two hours if not asleep. The next morning the patient was comfortable, and the dressings were not disturbed, except to moisten the outer compress with the same solution of carbolic acid. The case was now turned over to my son, Dr. Wm. G. Ogier, and Dr. Augustus Fitch, to whose unremitting attentions, day and night, the patient owes her recovery. The flap of skin outside of the pieces of wood used for the quill suture sloughed, but the peritoneal surfaces, which had been brought together, united firmly. In three weeks the wound entirely healed, and the umbilical projection disappeared.

A similar case has never come under my observation, nor have I seen one recorded. Umbilical herniæ are generally regarded of little consequence; they are so easily kept in place by a simple compress, that neither patients nor their medical attendants regard them as serious. But from the history of the above case it is evident that this simple malformation may endanger the life of the patient quite as much as a strangulated inguinal or femoral hernia.

ART. XVI.—*Symptoms of True Labour caused by Impacted Fecal Matter in the Large Intestines.* By JOHN J. BLACK, M. D., of New Castle, Delaware.

SEPT. 19th, 1869, I was summoned to a lady 21 years of age, six months pregnant with her first child. I found her in the midst of what appeared to be a strong expulsive labour pain. She had hold of her mother's hands; was bearing down strenuously, and complained of great pain in the small of the back. Was informed that there had been no escape of water, yet I expected to find the head engaged and well down. On examination per vaginam I was surprised to find the parts natural; the mouth of the uterus not at all dilated; the neck rather flaccid; yet about as usual at this period of gestation.

The mother told me, from her daughter's pains, she had expected the child to be born every minute—they having been regular about every fifteen minutes for four hours past. The patient said she had been troubled with them for two or three days before "off and on." I could not suppose the

pains to be otherwise than uterine, yet, under the circumstances, I felt somewhat puzzled, as no progress had been made in labour. Under the use of anodyne suppositories the pains gradually subsided and she obtained some sleep. The next morning I ordered an enema of warm water and salt—having felt some fecal matter in the rectum when making the vaginal examination, and supposing the getting rid of this would take away a source of irritation. The injection produced a moderate fecal evacuation.

For the next three days there was a tendency to recurrence of the pains, and constant nausea and vomiting, which I attributed in part to the anodyne. There was still no dilatation of the os uteri. On the night of September 23d I was again summoned in haste and found the patient, as on my first visit, with apparent uterine expulsive pains every ten minutes; but on examination found everything normal. She was now becoming exhausted from pain and nausea, and I requested Dr. L. P. Bush, of Wilmington, Del., to see the case with me.

When he arrived the patient was suffering pains every ten minutes, and he was as much surprised as I had been to find the os uteri in the condition before mentioned. A mass of fecal matter was again apparent in the rectum, having come down since I had last examined the parts. We determined to quiet the pains as before—give a purgative dose and use an enema of water-flour and croton oil every four hours. The first brought away about as many clay-coloured masses of the size of marbles as the one I had ordered before. The next enema brought little or nothing; but some time afterwards there was a spontaneous movement of the bowels—a part of it an aggregated mass so large as to cause great pain in its exit, and consisting of clay-colored fecal matter in balls varying in size from marbles to walnuts. Several hours afterward there was another similar evacuation, but not so large. The relief was now great—the pains entirely subsided—the nausea and vomiting ceased—the appetite immediately returned, and the case was now solved. This patient had suffered from obstinate constipation soon after becoming *enceinte*, which had yielded to attention and mild remedies. She had been free from it until a few days before the pains came on, and said the bowels had not been opened for six days before this time. I imagine these masses had been there much longer, and perhaps a channel of exit had existed through them. Were these pains uterine or confined to the rectum and colon? I think both. The uterus could be felt through the abdominal walls to be harder during the pains, and she complained of the knot at the lower part of the abdomen.

I do not think the fibres of the neck were affected, yet it is a wonder labour was not brought on. The uterus acted from sympathy and from direct irritation, as we know that during menstruation there is more tendency to looseness of the bowels, and during pregnancy to constipation, thus showing the mutual sympathy.

I had never met with a similar case, and I was at the time perplexed and annoyed, and if this hasty sketch should be the means of relieving professional anxiety or hours of suffering in a patient unfortunate as mine was, this will be my compensation.

NEW CASTLE, DELAWARE, Nov. 3d, 1869.

ART. XVII.—*On certain Peculiarities in the Construction of the Orbit.*

By HARRISON ALLEN, M.D., Professor of Comparative Anatomy and Zoology in the University of Pennsylvania.

THE following observations were incidentally made while I was engaged in examining crania for other purposes. They are in one sense, therefore, original. But, as every one knows, the almost exhaustive study devoted to descriptive human osteology, it is doubtful whether anything of importance can be added to the record. Subsequent examination of its literature served to confirm me, in many instances, in this probability, as well as to direct my attention to several features of orbital mechanism that had escaped me. While my facts may be old it does not follow that they are familiar. On the contrary, they are seldom if ever mentioned in text-books. The original memoirs containing their descriptions are found in journals devoted for the most part to purely scientific matter, and which, as a rule, are not accessible to the student. An attempt to bring this scattered material together in something of a connected form, is all that is claimed for this communication.

The bones of the skull may present many peculiarities with respect to their manner of articulation. I have in other places mentioned certain of these which had come under my notice, such as the method of union between temporal and frontal—parietal and sphenoid bones,¹ as well as the great differences which obtain between the shapes of the lower jaw, not only in different persons, but upon opposite sides of the same person.²

I now propose to notice the different methods after which the orbit may be fashioned; the floor being omitted as not presenting peculiarities of interest. As may be surmised, standard descriptions will not be widely departed from.

When an author's name appended to a statement is printed in italics, it signifies that I have not met with examples of the kind.

A. *Roof of Orbit.*—Instead of being formed entirely by the orbital plate of the frontal it may possess in addition a thin plate derivable, most probably, from the greater wing of the sphenoid.—(*Czermak*,³ *Hyrtil*.⁴)

¹ Remarks on the Conformation of the Mammalian Skull. Proc. Acad. Nat. Sci., Philad., vol. 18, 1867, 11.

² The Jaw of Moulin-Quignon.—Dental Cosmos, vol. ix. 169.

³ Czermak, Joh. Ueber einen eigenthümlichen Schaltknochen im Augenhöhlendache des Menschen. Siebold u. Kölliker's Zeitschrift, III., 1851, 27. (Taf. 2.) Six cases recorded, all in young people.

⁴ Hyrtl, Jos. Ueber wahre und falsche Schaltknochen in der *Pars Orbitaria* des Stirnbeines. Sitzungberichte der K. Akad. der Wissenschaften Wien, XLII., 1860, 213. (Taf. 1, 2, 3.) Gives twenty-five examples of the first. He defines the second (false bones) to be small isolated portions of the orbital plate of greater wing of sphenoid appearing upon the roof of the orbit, at or near the line of its articulation with frontal, entirely surrounded by the orbital plate of the latter.

B. Outer Wall of the Orbit.—(a.) Usually defined by the union between greater wing of sphenoid, external angular process of frontal and orbital process of malar bone it may show absence of articulation wholly or in part between the anterior portion of greater wing of sphenoid and malar bone. (Hyrtl.)¹ This—a normal appearance in crania of most mammals—appears sufficiently often in the skull of the aged to make it one of the most constant features of senility.

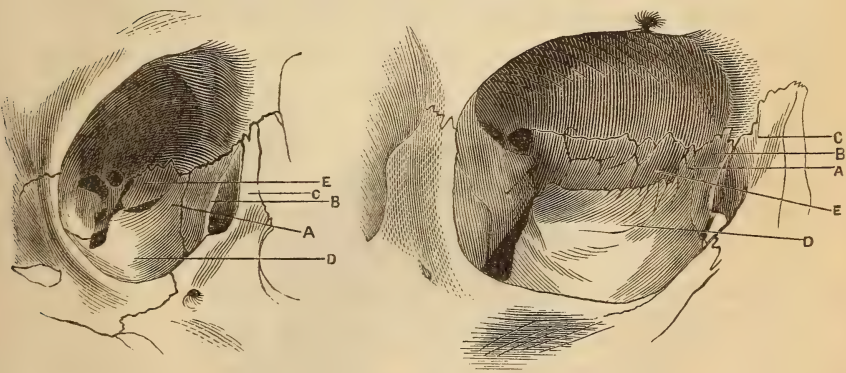
(h.) The sphe-no-maxillary fissure, normally formed by the space included between malar, superior maxillary, and palate bones, and greater wings of sphenoid, may be without the malar, in consequence of the sphenoidal quantity uniting with the superior maxillary. (Gruber.)² Holden³ mentions having seen this peculiarity. He apparently was not acquainted with Gruber's memoir.

C. Inner Wall of Orbit.—Usually composed of the sphenoid, os planum of ethmoid, and lachrymal bones,—it may conform to the following variations:—

(a.) A descending portion of frontal bone may intervene wholly or in part between sphenoid and ethmoid, or a process from the palatal may ascend to articulate with the frontal process, or may join the frontal directly. (Gruber.)⁴ These changes were most conspicuous in two skulls of idiots—one in Prof. Jos. Pancoast's collection, the other in the Wistar and Horner Museum.

Fig. 1.

Fig. 2.



A. Process of superior maxilla. B. Lachrymal bone. C. Nasal process of superior maxilla.
D. Orbital plate of superior maxilla. E. Os planum.

¹ Hyrtl. Handbuch der Topograph. Anatomie, 1865, 20.

² Gruber W. Abhandlungen aus der Menschlichen und Vergleichenden Anatomie, St. Petersburg, 1852, 116.

³ Holden. Human Osteology. London, 1855, 82.

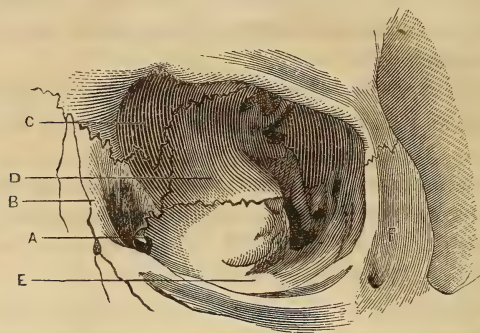
⁴ (Ibid.)

(b.) A descending process of the frontal may reach the orbital plate of superior maxillary bone, at floor of orbit, or may more rarely meet with ascending process from the last-named bone. (Gruber.)

In Fig. 1¹ it will be seen that the lachrymal bone is completely separated from the ethmoid (which is divided into several irregular areas) by an ascending process from the orbital plate of the superior maxilla. A similar arrangement is seen in Fig. 2.²

(c.) Lachrymal bone may be reduced to a rudiment, see Fig. 3. Specimen from Wistar and Horner Museum.

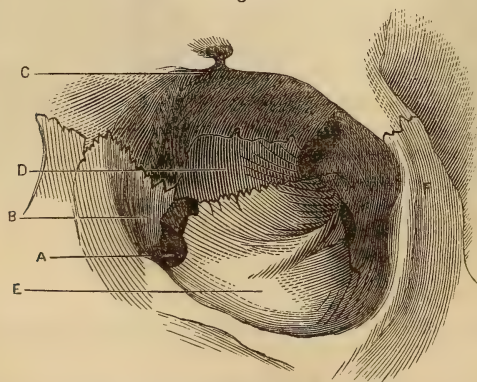
Fig. 3.



A. Rudiments of lachrymal bone. B. Nasal process of superior maxilla. C. Orbital plate of os frontis. D. Os planum. E. Orbital plate of superior maxilla.

(d.) Lachrymal bone may be absent; a small irregular space indicating the position it should occupy, see Fig. 4. W. and H. Museum (261).

Fig. 4.



A. Osseous interspace indicating the position for lachrymal bone. B. Nasal process of superior maxilla. C. Orbital plate of os frontis. D. Os planum. E. Orbital plate of superior maxilla.

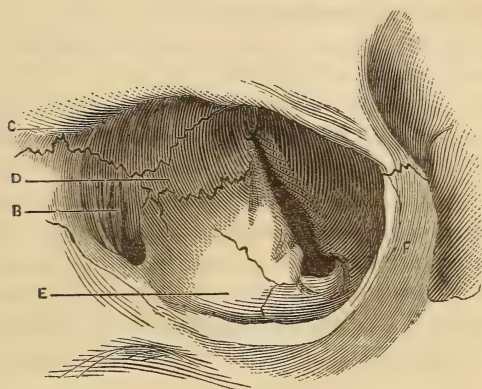
¹ From a skull of a young chimpanzee. Museum Acad. Nat. Sci.

² From a skull of Esquimaux, aged 11 years. Morton Cab. Acad. Nat. Sci.

It is quite probable that in this example an isolated rudiment of the lachrymal had existed during life. This absence with indicated space should not be confounded with the absorption of the bone in old age. See Hyrtl, Anatomie. (*Supra.*)

(e.) Lachrymal bone may be absent, no interspace (Gruber,¹ Meckel²), see Fig. 5. Wistar and Horner Museum (39).

Fig. 5.



B. Nasal process of superior maxilla. C. Orbital plate of os frontis. D. Os planum. E. Orbital plate of superior maxilla.

(f.) An accessory lachrymal bone may be found lying between the lachrymal proper and nasal process of superior maxilla. (*Luschka.*³)

(g.) A small ossicle may be seen at the anterior inferior region of inner wall of orbit wedged between the nasal process of superior maxillary, lachrymal, and malar bones. (*Rousseau,*⁴ *Gruber.*⁵)

¹ Gruber, W., Seltene Beobachtungen aus dem Gebiete der Menschlichen. Anatomie. Müller Archiv. xv. 1848, 412 (Taf. xiv.).

² Meckel, Path. Anat. I. 345.

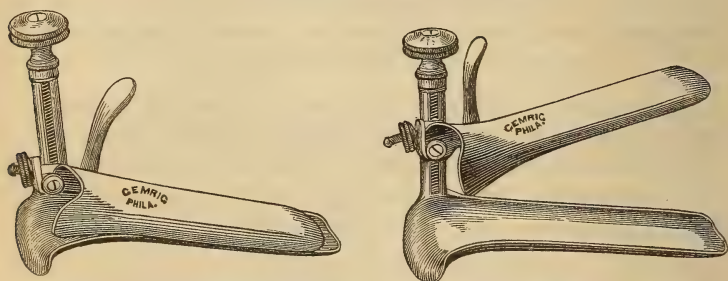
³ Luschka, H., Das Nebenthänenbein des Menschen. Müller's Archiv. 1858, 304 (Taf. xi.). Twelve cases observed; three figured.

⁴ Rousseau, E., Description d'un nouvel os de la face chez l'homme. Annales des Sci. Naturelles, xvii. 1829, 86 (Pl. 5, A. Figs. 1—3). Six cases observed.

⁵ Gruber, W., Bulletin Physico-Mathématique de l'Académie des Sciences de Petersbourg, viii. 1850.

ART. XVIII.—*Description of an Improved Speculum.* By J. STOCKTON
HOUGH, M. D. (With two wood-cuts.)

THE improvement we have made in the instrument described by us in this Journal for July last, consists in the simplification of the mechanism, and so changing its position as to allow of a free opening on one side throughout the entire length of the blades. This we believe to be an important improvement, as it renders the instrument suitable for the operation for fistula, and does not impair its utility for making vaginal examinations. Another advantage of this modification is the facility of introducing the index finger of the right hand when it is necessary to explore the condition of the parts with the finger. By rotating the instrument a quarter of a circle this opening will look toward the perineum and will allow of the depression of the uterine sound in cases of anteversion and anteflexion of the uterus, which is always, in these cases, a desideratum, and cannot be accomplished with the great majority of metallic instruments, and not at all when a glass one is used. For this improvement in the mechanism I am indebted to Mr. J. H. Gemrig, the maker of the instrument. It will be seen from the figures that the ends of the blades have a peculiar shape, differing



from that of all other specula. This shape is difficult to describe, and can be best understood by reference to the figures. This form I have found of great advantage where it is desired to *pack* the vagina, as there is not the same disposition to pull the material out when the speculum is withdrawn as when the ordinary shaped blade is used. The edges of the blades are turned in, giving them a corded appearance, which allows of the instrument being closed in the vagina without pinching the tissues. The mechanism does not project beyond the end of the blades, and is not at all in the way of the operator, as it is in the majority of instruments designed for these operations. The *short anterior blade* still continues to be one of the particularly desirable and distinguishing features of this instrument in making uterine examinations: as is the *parallel expansion* in making vaginal examinations. The *angular expansion* also remains as before.

TRANSACTIONS OF SOCIETIES.

ART. XIX.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1869. May 13. Dr. HUTCHINSON exhibited a specimen of *cancer of the liver*, removed from a patient in whom the lung contained a similar deposit.

Melanosis of the Skin and Areolar Tissue.—Dr. S. W. GROSS presented a specimen of tuberiform melanotic cancer, of eleven months' standing, removed from a stone-cutter, seventy-two years of age. The tumour, which was of the size of a walnut, lobulated, and of a sooty colour, occupied the anterior and radial surfaces of the right forearm midway between the wrist and elbow, and was quite movable, but with firm attachments. It was the seat of constant lancinating, stinging pains, which were much aggravated by work, but uninfluenced by atmospheric changes. On its summit there was an abrasion rather than an ulcer, from which there was, now and then, a slight hemorrhage.

In the line of the median cephalic vein there existed two small and hard lymphatic enlargements, which were subcutaneous, and rolled about under the finger. Along the inner edge of the biceps muscle, just above the middle of the arm, there were three secondarily enlarged lymphatic glands, forming quite a conspicuous mass beneath the skin, through which they appeared of a dark colour. In the axilla, also, there was extensive lymphatic involvement. All of these growths made their appearance three months ago.

The patient was losing flesh, his appetite was bad, and the bowels were constipated. On account of the severe pain in the tumour, he was obliged to quit work two weeks ago.

Professor Gross, much against his judgment, but at the man's earnest solicitation, with a view of relieving his sufferings, removed the large mass at the clinic of the Jefferson Medical College. The radial vein and some filaments of the external cutaneous nerve were exposed by the dissection, and one small artery, which alone appeared to nourish the tumour, was ligated.

The growth was found to be intersected by dense fibrous filaments, and was undergoing softening at its centre. Microscopically examined, it was seen to consist of a stroma, with characteristic cells and pigment matter in granules and large masses.

Case of Fibroid Tumour of the Upper Jaw.—Dr. ASHHURST exhibited the specimen, and read the following history:—

R. H., aged 17, a native of this country, and an iron-worker by trade,

was admitted to the Episcopal Hospital on Jan. 20, 1869. It was impossible to obtain any satisfactory account of the previous history of this case, but we learned that he had noticed some obstruction of the right nostril for several months, and latterly the cheek had become swollen below and in front of the malar protuberance. On examination the hard palate was found depressed, and in one part much thinned, so that the presence of fluid above it was easily recognized. There was no enlargement in the region of the canine fossa, no encroachment upon the orbit, and scarcely any on the nostril. It was evident that there was dropsy of the antrum, and the swelling of the cheek—which the patient said was not constant—was supposed to be either due to inflammatory thickening, or possibly a new growth, unconnected with the maxillary affection. A trocar and canula were introduced through the bulging fluctuating surface of the hard palate, and a considerable quantity, probably a fluidounce, of serous fluid deeply tinged with blood, evacuated with immediate relief to the symptoms.

The amendment in the patient's condition was, however, of but short duration, and in the early part of February profuse hemorrhage from the posterior nares occurred on three several occasions. He now mentioned (a fact of which we had before been unaware), that similar hemorrhages had occurred before he sought admission to the hospital. Examination at this time revealed the existence of a solid tumour, the presence of which when smaller had been masked by the fluid accumulation in the antrum. It was now perceived that the entire alveolar border of the jaw was displaced downwards and outwards, and the finger introduced behind the soft palate recognized a tumour projecting backwards into the pharynx. The soft palate itself was manifestly depressed by the superincumbent mass. No connection could be traced between the maxillary tumour and the swelling in the cheek, which I thought I could isolate from the larger mass, getting my finger as I supposed behind and entirely around it.

As the patient was rapidly becoming anæmic from repeated hemorrhages, and as the dyspnoea was constantly increasing, it was evident that operative interference was urgently demanded. Accordingly, on Feb. 18, with the approval and assistance of my colleagues, I removed the greater portion of the right upper maxilla (leaving only the orbital plate, which was perfectly normal), and then proceeded to enucleate the tumour with its several ramifications as rapidly as possible. The external incisions were through the median line of the lip along the ala of the nose, and transversely below the orbital ridge. The vessels of the flaps were tied as they were divided. The bone sections were made with strong cutting pliers, and the jaw as well as the deep-seated portions of the tumour wrenched out with the "lion-jawed" forceps of Sir Wm. Fergusson. The last portion enucleated brought with it a bulbous mushroom-like projection, which proved to be the tumour that had been felt in the cheek. The whole growth was very vascular, and a great deal of blood was lost during the latter stages of the operation. The lips of the wound were approximated, and the patient rallied from the chloroform anæsthesia sufficiently to answer questions, but never fairly reacted, and died about two hours after the operation.

The specimen shows the greater part of the tumour and the portion of jaw removed. The antrum is greatly enlarged. The morbid growth appears to have originated from the posterior wall of the antrum, pressing down the hard palate, and partially displacing the alveolar ridge; it

seems then to have escaped into the middle meatus of the nose, and to have grown rapidly upwards (towards the sphenoid and ethmoid bones), backwards into the pharynx, and finally to have crept outwards through the pterygo-maxillary fissure, making its appearance below the malar bone, in the soft structures of the cheek. The tumour, under the microscope, showed a large number of small vessels, with fibres, cells, and free nuclei. Even in its present state, shrunk from preservation in alcohol, the tumour is the size of a hen's egg, and before removal, when distended with blood was very much larger—much larger, I may add, than any of us supposed before beginning the operation.

I may perhaps be pardoned for alluding to one or two points of clinical, rather than pathological, interest. The unfortunate result in this case was, I think, manifestly due to the combined effects of shock and hemorrhage. The patient was under the influence of chloroform for a considerable time (and very thorough anæsthesia is requisite for operations on the jaw), but it is to be remembered that without anæsthesia, such an operation would be well nigh impossible. The immediate proximity of the tumour to the base of the skull is a very serious complication, and has not unfrequently been the cause of rapid sinking after the operation. This occurred in a case of Liston's. (*Erichsen's Surgery*, p. 863.) Mr. Hewett attempted to remove a fibrous tumour from behind the jaw by what has been called osteo-plastic resection; the patient died before the operation could be terminated. (*Med.-Chir. Trans.*, vol. xxxiv. p. 43.) Quite recently, Sir Wm. Fergusson in an operation for tumour connected with the upper jaw, found the hemorrhage so profuse that, to prevent a similar untoward result, he thought it better to close the wound, purposing to conclude the operation on another occasion. (*Med. Times and Gazette*, Aug. 22, 1868.) Careful and repeated consideration and criticism of the case I have just narrated, have failed to suggest any plan by which the operation might have been rendered more likely to terminate well. Sir Wm. Fergusson's plan would not have answered in this case, for the tumour itself was so vascular that, to leave any portion in position, would have exposed the patient to an almost certainty of continuous bleeding. Ligature of one or both common carotids would of course be out of the question. Possibly, had the operation been done earlier, the patient being less anæmic at the start, and the tumour smaller, a more favourable result might have been attained. The case was one that gave me a great deal of anxiety and care during the whole time it was under my observation, and, I think, should be placed on record, if for nothing else, as an illustration of the difficulties of diagnosis and the risks of treatment in all cases of tumour connected with the upper jaw and the base of the skull.

Fatty and Contracting Kidneys; Gastric Hemorrhage, Chronic Gastritis and Gastric Ulcer, with Hemorrhagic Erosions.—DR. JAMES TYSON exhibited the specimens, with the following account of the case:—

Being asked to visit the child of the Rev. G. A. D., my attention was called to the father, who lay abed in the same apartment. He said he was suffering from the effects of a violent cold, but considered himself almost well, so that I gave him little attention and no advice. On my next visit to the child, a day intervening, his wife called my attention to a dyspnoea, and "choking" cough, from which the father suffered, more particularly at night. I now examined him closely, and found all the physical signs of a pneumonia in the lower lobe of the left lung. He was placed under ap-

propriate treatment, but convalesced so slowly that it appeared there must be some insidious cause which interfered with recovery. In searching for this, the urine was examined and found to be albuminous, containing however, but a tenth or less of its bulk. No other symptoms called attention to the kidneys, and a hasty microscopical examination revealed no casts at this date.

The patient was forty-seven years old, and for twenty-five years had been engaged most laboriously in the duties of his profession, exposed to all sorts of weather, often remaining for many hours with his feet wet and cold. He had always considered himself vigorous, but his wife has noted a decline in his physical condition in the past two years, during which, and for some years previous, he has been the subject of occasional attacks of so-called "biliousness," but with no other symptoms calling attention to the stomach. On the contrary, his appearance was that of a hale, well-nourished man.

He was placed upon the peracetate of iron in addition to the previous restorative treatment, and convalescence progressed. By the 27th of March he was so far recovered as no longer to require my visits. I advised him of the possible state of his kidneys, enjoined that he should especially obviate fatigue, continue the use of peracetate of iron, and desired that he occasionally send me specimens of his urine.

I heard nothing of him until April 15th, when I was again sent for by his wife. I found he had unduly exerted himself in the nineteen days interval, in attempting to assume his laborious charge, had again taken cold, and was now suffering with bronchitis involving the bronchi of medium size, accompanied by persistent nausea and vomiting, furred tongue and fetid breath, and withal was greatly prostrated, though he referred all his symptoms to the liver. No trace of the late pneumonia remained. Appropriate treatment was ordered, the urine examined, found to contain a little more albumen, *granular* and *hyaline tube casts*. Quantity not measured, but evidently deficient. At my next visit, I found the vomiting continued, and that in consequence, the treatment of the bronchitis must be restricted to counter-irritation. In the vomited matters was included dark, grumous liquid, presenting the characters of altered blood, and found to be such on microscopic examination, by its crystalline constituents; no corpuscles were present. Acute pain in the cardiac end of the stomach, increased by movements of respiration, annoyed the patient much. No signs of a tumour. The treatment consisted of a blister to epigastrium, subnitrate of bismuth and quinia, with beef tea and stimulus as much as could be retained. This was Sunday the 18th. On the 19th, more vomiting of blood. Remedies, however, retained. On the 20th, more vomiting of blood. Dr. DaCosta saw him this P. M., and continued treatment. Also ordered dry cups to entire chest. No further vomiting of blood until 6 A. M. of the 22d, after which none occurred previous to death. The pain gradually abated, and the bronchial symptoms slowly subsided, but there were occasional fatiguing paroxysms of coughing, attended by tough and viscid expectoration. Some abatement occurred in the gastric symptoms, and as stated no more blood was vomited after the 22d. But food could be retained in but small quantity, exhaustion progressed, and the patient died quietly at 6 A. M. of the 27th of May, without coma or convulsion, having requested half an hour earlier that his bladder should be emptied by the catheter.

Post-mortem twenty-eight hours after death.—No external peculiarities.

A thick layer of subcutaneous fat throughout the body. Thoracic viscera entirely normal; recently inflamed left inferior lobe had quite assumed its natural condition.

The *kidneys* were little more than half the usual size, nodulated, and the left contained two small cysts, each four lines in diameter.

Microscopically, the tubules in the convoluted and straight portion exhibited the characters common to the condition described by Beale as the *fatty and contracting kidney*, being in certain places converted into a connective tissue-like structure, in others highly fatty, while in others, again, the epithelium seemed little altered.

The *stomach* was empty. In its cardiac two-thirds it was suffused with redness, and exhibited marked arborescent congestion. The mucous coat was softened throughout, and exhibited distinctly a single true ulcer. Others may have been obscurely present, but the most interesting feature was the existence of a large number of hemorrhagic suffusions, three or four lines in diameter, surmounted in each instance by a point of erosion, the evident source of the hemorrhage before death.

Microscopic examination revealed a granular condition of the capillaries, but the epithelial lining of the gastric follicles was present in its entirety, and seemed little altered.

The renal malady possesses additional interest in its bearing upon the subject of the different *forms* of Bright's disease. It will be remembered that there are usually made four varieties: 1st, the enlarged and acutely congested kidney of acute Bright's disease; 2d, the enlarged fatty kidney; 3d, the chronically contracted and wasting kidney; 4th, the amyloid or albuminoid kidney. To these, Dr. Beale adds a 5th, which he terms the *fatty contracting kidney*. Whether this be or be not a form or stage of the chronically contracted kidney, I think it can be easily made to appear that the case here presented corresponds, as precisely as may be, to the affection thus indicated by Dr. Beale. In his recent edition of *Kidney Diseases and Urinary Deposits*, p. 61, we read: "One of the most serious forms of renal disease is that in which the formation of new texture, the deposition of fatty matter, and shrinking and wasting of the gland tissue are proceeding at the same time. The occurrence of these different changes renders this form of kidney disease most difficult to investigate, and has given rise to much misapprehension respecting it. Tubes of twice or thrice the normal width are often seen close to tubes considerably less than the natural diameter. Of the first, many are choked with fat, some loaded with epithelium, and others filled with glistening material. In some of the wasted tubes, all traces of original structures have entirely disappeared. Not far off from these, perhaps, tubes may be seen in which little departure from the normal characters can be discerned." With regard to symptoms, he also says, "The attack may come on as one of slight acute dropsy. The urine containing a large quantity of albumen, and being of fair sp. gr. 1020, or higher. There is usually little œdema, and for some time the case appears likely to progress favourably. But the albumen does not diminish. In some instances, vomiting or head symptoms come on after two or three months, and the patient soon dies. The symptoms may not have been at all urgent, and up to within a week or two of the patient's death, there may have been nothing in his appearance to lead us to expect the extremely fatal form of disease from which he is suffering.

"Even a careful examination of the urine does not always enable us to discover the nature of the disease. In one of these cases I failed to detect any casts whatever, although the urine was frequently examined; in

another, only a few were found, with a very few fat cells interspersed." Again, "Persons suffering may not be aware that anything is the matter, even up to a few weeks before death. They are often full coloured, well nourished, and are perhaps considered by themselves and their friends to be in thoroughly good health. The patient, perhaps, consults the practitioner on account of *obstinate vomiting*, giddiness, and feeling of heaviness about the head, and dimness of sight. At this time, there may be *little to direct the attention to the kidney*; but if the practitioner examines the urine, he may find a very large quantity of albumen present. I have seen cases in which the nausea and headache were the only symptoms complained of, and have been surprised to find, on examination, evidence of advanced kidney disease."

The history of the foregoing case need but be recalled, to trace the almost complete correspondence throughout, between it and the symptoms and state of the kidney detailed by Dr. Beale. It is this sort of case, according to Beale, which sometimes presents itself for life insurance, and unless the risk is refused on the ground of doubtful habits, the case may not be rejected, and the life drop within a month, the proposer himself having been assured that he was well at date of examination. And I must confess, had my own patient presented himself for such examination three months previous to death, I should most probably have recommended him. And the conclusion of Dr. Beale upon this point is undoubtedly correct, that nothing but an examination of the urine in every instance can save life insurance companies from occasional losses of this kind.

May 13. Dr. THOMSON presented a specimen of *Hypertrophy and Dilatation of the Heart with Insufficiency and Cretaceous Degeneration of Aortic Valves*.—The patient was twenty-nine years old, and exhibited previous to death most of the usual symptoms of the disease.

Malignant Disease of the Stomach; Perforation; Death from Peritonitis.—Dr. THOMSON presented the specimen with the following history.

M. H., a seaman, aged forty, entered the Episcopal Hospital January 20, 1869, suffering from a contusion of the left side caused by a fall into the hold of a vessel. No serious injury had been received, but as the man seemed to be in feeble health, and stated that he had been exposed to malarious influence, he was placed upon a tonic course of treatment, and, as a convalescent, performed duty as assistant nurse in the ward. He took his meals at the full diet table, and gave no indications of the serious lesion which then existed.

Feb. 5. He complained of acute pain in his side, which increased, and was accompanied by vomiting for the first time on the 6th. Acute peritonitis was recognized, which followed a rapid course, and caused his death on the 8th.

The autopsy was made by the resident, Dr. Mustin, who states that the abdominal cavity contained a quantity of yellow fetid fluid. The stomach was adherent to the transverse colon, and in the midst of a large mass of scirrhus a perforation of the walls of the stomach was observed. It is worthy of note that such extensive disease should have caused severe symptoms only a few days previous to death.

Dr. AGNEW recalled a case analogous to this described. An employee in a wall-paper establishment had been a confirmed dyspeptic for many years, complaining of oppression and eructation of food, but was never disqualified for work. On the day before he died, going into the yard, he

experienced a sensation as of something "giving away." He went to bed in extreme pain, followed by tympany and stercoraceous vomiting, and died in forty-eight hours. A post-mortem examination revealed perforation by ulceration from malignant tumour of the stomach.

Report of Drs. Harrison Allen and Edward Rhoads, the Committee to whom was referred the above Pathological Specimen.

The specimen was preserved in alcohol, but the tissues were not shrunk. The growth commenced abruptly about midway along the lesser curvature, involving the outer wall and upper and lower borders up to the immediate proximity of the pylorus. The growth consisted of a series of nodular enlargements blended irregularly together, and forming by their projection on inner aspect of anterior surface a cup-shaped cavity about one and a half by two inches in dimension. The cavity was of irregular depth, and presented a prominent, elevated rim, one-half to three-fourths of an inch in width, except for a space of about an inch where it was flattened, the growth here having extended under the peritoneum outwardly. The bottom of the cavity was ruptured. This opening was about an inch and a half long, had firm nodular walls, and looked downwards and forwards. The pylorus itself was not thickened, but was reached by a hardened nodule at its upper and lower borders. The mucous membrane of cardiac end appeared healthy. Around the edges of the crater-like cavity it was still smooth but seamed and contracted, and at one point there was a pedunculated process extending downwards. This measured one and a half inches in length. The bottom of the cup was roughened, eroded, and ulcerated. Upon dissection it was discovered that the seat of the growth was between the submucous and subperitoneal layers. When the nodules were cut there exuded a considerable quantity of thick fluid which was found upon microscopic examination to contain oil globules, granular matter, and pear-shaped cancer cells. The same elements were associated in large proportion with fibrous stroma in the diseased tissue.

May 27. Necrosis of Tibia; Amputation.—Dr. PACKARD exhibited the amputated leg of John Davis, æt. 39. There appeared no other exciting cause than a blow from a piece of timber on shipboard. The prominent symptom was intense pain, on account of which he implored amputation.

Dr. AGNEW had previously seen the patient, both at the Clinic of the University of Pennsylvania, and at the Pennsylvania Hospital. At the latter he admitted a history of syphilis. He complained of the intense pain, and at the hospital, Dr. Agnew had trephined the bone, thinking there might be abscess, but it proved healthy at that date.

Albuminoid Degeneration of Kidneys; Pericarditis; Embolism of Brain and Spleen.—Dr. HUTCHINSON exhibited the specimens, and read the following history of the case from which they were derived:—

J. J. M., æt. 35, an Irishman, shoemaker, single, a moderate but never an excessive drinker, was admitted into the Penna. Hospital Feb. 11, 1869. Patient's health has always been good until about three years ago, when he was under treatment at the Pennsylvania Hospital, for a slight attack of dropsy, which was accompanied by such an excessive flow of urine as to lead to the suspicion that he might be affected with diabetes. The dropsy yielded, however, to the remedies employed, and he seems to

have been in the enjoyment of at least average health, until the beginning of the present year, when, upon awakening one morning, he found that his left eyelid drooped, and that there was paralysis of the left side of the face, together with some œdema. Epistaxis also soon after took place and has recurred repeatedly, being probably dependent upon ulcerations of the nasal mucous membrane. Soon after he noticed increased frequency of calls to micturition, occasionally as many as twenty during a night. There was, however, no difficulty nor pain in passing his urine, which flowed in a small and feeble stream, but never came away involuntarily. At the time of his admission there was a tendency to the accumulation of food between the teeth and the cheek on the left side, but there was no other evidence of facial paralysis; there was still swelling of the face, but no ascites nor œdema of the lower extremities. His urine was found to be increased in quantity, 96 ounces being the amount passed in twenty-four hours; it was pale in colour, acid in reaction, of low specific gravity, 1010, and contained about one-fifth of its bulk of albumen. Patient's ozæna gave rise to a very offensive sanious discharge. The treatment adopted consisted in the administration of Basham's mixture, and an astringent injection for the nostrils. Microscopic examination of the urine was made by Dr. J. G. Richardson. A few moderately dark granular casts, without cells or blood corpuscles, and crystals of the triple phosphate were found. On March 17, he had an attack of erysipelas of moderate severity which lasted ten days. While convalescing he called my attention to the fact that there was partial paralysis and some hyperæsthesia of the left arm. His heart was at this time carefully examined. The area of percussion dulness was increased, the impulse not very forcible, the sounds indistinct. No murmur was, however, detected. Three days later the paralysis and hyperæsthesia had passed away. On April 24 dropsy reappeared in the face and legs; there was moreover œdema of the lungs, and some ascites. As the œdema of the lungs gave rise to much embarrassment of the respiration, elaterium gr. $\frac{1}{8}$ was ordered. This produced several watery stools, and was followed by great relief. On April 30 I transferred the wards to Dr. J. Aitken Meigs, and the patient passed from under my observation. Dr. Hunter, the resident, however, informs me that three days before the death of the patient, which happened May 15th, choreic movements of the right side of the body, especially of the arm, together with some loss of power on the same side, developed themselves.

The autopsy was made four hours after death.

Head not examined; body œdematous and well covered with fat; Thorax, serous fluid in both pleural cavities; lungs œdematous and compressed by effusion; pericardial cavity distended with about four ounces of fluid; visceral layer of pericardium coated with false membrane of recent formation, adhesions passing between the two surfaces; heart hypertrophied and somewhat dilated (these alterations most marked in the left ventricle); valves competent; some vegetations on the free surface of the aortic valves.

Abdomen: liver enlarged and displaced downwards in consequence of the pleuritic effusion, so that its lower edge reached half way to the umbilicus; spleen enlarged, and contained embolic patches in different parts of its structure; kidneys apparently somewhat enlarged; the surrounding areolar tissue loaded with fat, which was also present in large quantities in the calyces of the kidneys; their surface was finely nodulated; capsule adherent; on section, the arterial substance appeared to be atro-

phied; the surface was studded with white points. The iodine test showed the presence of amyloid degeneration.

It is to be regretted that no examination of the head was made, as it would undoubtedly add very much to the value of the case if we knew positively, what we cannot do otherwise than infer, that the paralysis with which the patient was at various times affected, and the chorea which occurred just previously to his death, were caused by emboli in the smaller branches of the cerebral arteries.

Microscopical Examination by Dr. J. G. Richardson.—The kidneys, which had undergone most marked contraction, showed beneath the microscope a peculiar appearance of the Malpighian corpuscles, whose convolutions were filled with a transparent refractive substance, having a waxy lustre, and becoming of a bright red color when acted on by an aqueous solution of iodine.

The uriniferous tubules were, in many portions of the specimens examined, filled with a similar matter, which assumed an analogous tint, though less intense under the application of iodine.

The smaller arteries around which the Malpighian corpuscles were closely clustered, were decidedly thickened, and exhibited much greater rigidity of their walls than normally exists.

Dr. ALLEN exhibited the leg of a patient, in whom amputation was performed on account of varicose veins, and who died precisely two weeks after the operation from "heart clot."

June 10. Colloid Cancer, involving Substance of Peritoneum and Lymphatic Glands, more particularly along the Vertebral Column, and, to a less degree, also the Pleura. Dr. WILLIAM PEPPER presented the specimen and read the following history:—

— — —, æt. about 40, a postman, who had enjoyed general good health, with exception of an attack of malaria and diarrhœa, about 1865, while in army, and a severe attack of jaundice, some years before, from which, however, he entirely recovered without any unpleasant sequelæ, began to notice, in early part of 1868, a swelling in lower part of abdomen. This increased steadily but slowly, without any disturbance of general health.

His account of the beginning of the attack was, that it originated with acute symptoms: violent pain at first in right side, but soon extending over the whole abdomen; vomiting, scanty urine, great sense of prostration. These symptoms subsided after a week or ten days, and left considerable enlargement of the abdomen. As will be gathered from further description of the case, it is probable that they were due to rupture of a small cyst and consequent peritonitis.

There was for some months little or no emaciation or loss of strength; appetite remained good, and he was merely troubled with occasional sense of epigastric distress and tension. No alteration of urine, which was repeatedly examined and always found healthy. Bowels usually constive, requiring use of laxatives.

He had his clothes made so as to accommodate the growing tumour, and continued on his round delivering letters.

Towards close of 1868, enlargement became so great as to much incommode him—his abdomen being, at that time, as large as a woman at full term. He was then tapped in median line some inches above pubis, and several pints of serous fluid drawn off. The wound healed quickly,

and he returned to his work. In a few months (middle of February, 1869) it became necessary to tap him again. There was then distinct fluctuation in various directions in the abdomen; though it was evident that there was a tumour in addition to the free peritoneal fluid. Paracentesis was again performed by Dr. Levis; the trocar being introduced to the left of the median line and higher up. When first introduced, about $\frac{1}{2}$ of pinkish serum with little shreds of lymph were discharged, and the flow then stopped. On withdrawing the trocar, the direction of its point was changed slightly, and a puncture made through a thin walled cyst, which discharged several ounces of transparent, almost colourless, viscid fluid—which became a firm, solid, trembling jelly on exposure.

The first fluid was highly albuminous, contained chloride of sodium and urea, and deposited a very few large round granular nucleated cells.

The colloid material was not examined carefully. The puncture oozed for some time, but healed nicely. The operation did not cause much reduction in his size, but rather merely a subsidence of one portion of abdomen which had been unusually prominent.

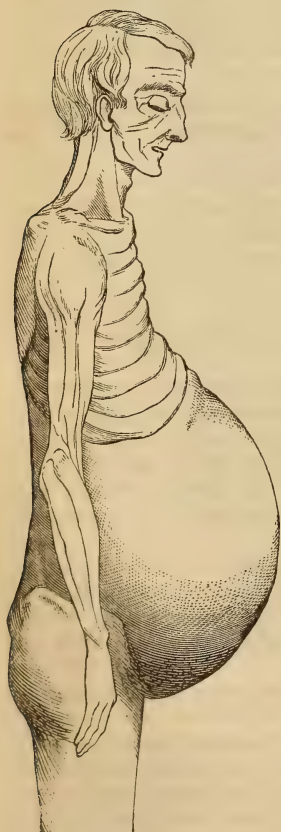
In March, his general health was evidently suffering much. He lost flesh and strength; had no hectic nor sweats; no cachectic appearance; no jaundice, no appearance of marked leucocythæmia; appetite rather poor, and unable to gratify it from ensuing distension; respirations superior costal, and he is unable to lie down on back, though he can lie on either side. No cough or sputa; heart healthy; urine continues normal in quantity and quality, passed somewhat too frequently; bowels costive, opened by laxatives.

His appearance at this time was remarkable. Arms and chest quite emaciated, though not extremely so; legs œdematous from venous obstruction; abdomen enormously distended (see sketch), entirely symmetrical; enlargement projected laterally and anteriorly; projection at epigastrium singularly abrupt, and the ensiform cartilage was bent forwards at a right angle. The whole base of the chest was expanded. The liver and heart were pushed upwards.

There was no tenderness over abdomen, excepting at and near epigastrium, and in neighbourhood of point of puncture in second operation.

Palpation did not elicit fluctuation from one side of the abdomen to the other, but in several portions of the abdomen, as in right side and just above umbilicus, there was distinct fluctuation. Strong palpation caused no sense of shock.

There was dulness on percussion over the entire front and lateral aspects of the chest, the only resonance being found in lumbar regions, and most markedly in either when he lay upon the opposite side.



The veins of the abdominal walls were somewhat distended.

The patient urgently insisted upon an operation being performed for his relief; and as, in middle of April, the tumour was enlarging; œdema and discoloration of legs increasing rapidly; cutaneous veins of abdomen enormously distended on lateral aspect of abdomen, and dyspnœa becoming urgent; an exploratory incision was made by Dr. Levis in median line, about half a gallon of peritoneal fluid evacuated, and an enormous tumour (described below) found filling the abdominal cavity, and entirely inseparable from its attachments to all the viscera. The operation was abandoned; the incision closed, and the patient died in three days.

Diagnosis.—The history of a severe attack of jaundice might have turned the attention to the liver, but the entire absence of any permanent disturbance of its function proved that there was no organic disease of its tissue; while the character of the fluid drawn off conclusively showed that it was not a hydatid growth. The absence of leucocythemia or extreme anæmia, the symmetrical character of growth, and the fact that it began in lower part of abdomen, excluded the idea of a splenic cyst.

The absence of any renal symptoms, hæmaturia or albuminuria, rendered it certain that both kidneys were not involved; and the symmetrical character of the growth rendered it improbable that it could depend upon hydronephrosis of one kidney. Yet the manner in which he described the symptoms of the acute attack in beginning of his sickness, made it resemble somewhat an attack of nephritic colic.

The absence of any cancerous cachexia also, such as might be presumed would attend extensive colloid cancer, made it probable that it was a purely cystic disease.

And the existence of urea in the fluid withdrawn by paracentesis, which was believed at that time to come from a cyst, and not to be peritoneal effusion, also tended to direct suspicion to the kidney.

Consequently the diagnosis rested between enormous hydronephrosis principally of one kidney, and cystic disease of the omentum.

Autopsy.—Thorax and abdomen alone examined.

Upon cutting through the abdominal walls, the peritoneal cavity was found to a great extent obliterated by close and strong adhesions between the parietal peritoneum and the tumour below described. Upon forcibly breaking up these adhesions, the parietal peritoneum was found thickened and studded over with numerous nodules. The entire abdominal cavity was filled by a huge mass, which extended far up into concavity of diaphragm, and downwards into pelvic cavity. This morbid growth was quite symmetrical, and upon close examination proved to be composed chiefly of the greater omentum, with some additional outlying masses. The omentum was enormously hypertrophied, being at least five inches in thickness, and reaching from the epigastrium down to the pubes. Its anterior surface was invested by a thick opaque white membrane. Upon cutting into it, its structure was found to be composed of a stroma of dense fibrous tissue, arranged so as to leave cystic cavities of varying sizes, some being barely visible to the naked eye, and others having a diameter of several inches. The fibrous septa separating these cavities were firm, but rarely thick. The inner surface of the large cavities presented a smooth, serous appearance. The contents of all the cavities were of a thick jelly-like character, varying in colour from a light amber to a decided red. The lateral borders of this mass were rounded, but

the lower margin presented innumerable cystic nodules, varying in size from one-twelfth of an inch to one inch in diameter, and containing a similar gelatinous substance. In some places these nodules were partially imbedded in a stroma, but in others they seemed attached to each other merely by delicate fibrous strings. Upon raising this mass, the intestines were found matted together, and imbedded in similar colloid growth. The glands along the vertebræ were enlarged, and a section presented an areolar structure, exuding colloid material. There was an enlarged gland in left groin presenting a similar degeneration.

The abdominal viscera, liver, spleen, and kidneys, presented no positive disease of their structure. There were, however, several very large nodules, $1\frac{1}{2}$ to 3 inches in diameter, of firm colloid growth, attached to under surface of liver; and on left side of abdomen there was a large mass, six inches in diameter, extending from left border of the greater omentum to inner surface of spleen, which was probably the diseased and enlarged lesser omentum.

The peritoneum lining the concavity of the diaphragm was studded over with large and small nodules, which were adherent to and had produced depressions in the concavity of the liver.

Similar nodules were found springing from the pleura investing the diaphragm, especially in the right thorax. The bronchial glands were very much enlarged, and presented colloid degeneration, and there were several small nodules loosely attached to the pulmonary pleuræ. There was, however, no disease of the tissue of the lungs.¹

It will be observed that, with the exception of the lymphatic glands, the disease was limited to the substance and surface of the serous membranes.

Microscopic examination of the colloid material from one of the cystic cavities in the omentum showed numbers of quite large cells, round, oval, or polygonal, and occasionally aggregated in small plates, like epithelium; with delicately granular contents, and presenting a single clear nucleus. In some instances, the nucleus filled the containing cell almost entirely, so that the cell seemed to have a double contour; in other cases, the nucleus filled the greater part of the cell, leaving a crescent-shaped cavity between the cell-wall and itself. In all these cells, the nuclei themselves were granular, and the surrounding portion of cell was clear.

Examination of a small and unusually firm nodule, whose surface on section showed very few cysts visible to the naked eye, but exuded a glutinous colloid substance, showed a dense stroma of unusually long and closely intertwined fibres, which were pale and flexible, and, in many instances, appeared double-bordered. This stroma included minute cystic cavities, quite closely packed with cells, such as those described above.

A portion of the colloid matter, which was of clear amber colour, presented a sp. gr. 1017.8. Fifteen grammes of it evaporated to dryness yields a residue of .79 gramme. This yielded a blackish-gray ash, weighing .058 gramme, showing the amount of organic matter in 15 grammes to be .732 gramme. Five grammes, treated with f3ijss absolute alcohol, filtered, and filtrate evaporated, yielded of alcoholic extract .033 gramme. Five grammes, treated with f3ijss ether, filtered, and filtrate evaporated, yielded of ethereal extract .001 gramme.

¹ A life-size water colour painting of this specimen was exhibited to the Society.

In answer to an allusion to the diagnostic value of the existence of urea in the fluid withdrawn by paracentesis, Dr. MITCHELL said that the presence of urea was so common under circumstances like these, that he was in doubt as to whether it could be considered of great importance. Thus it is found in the serum of the cavities of the brain, and the aqueous humour of the eye in health.

Dr. PEPPER said that he was aware that it was found in serous effusions, but he thought not in such noticeable quantity as in the present case, unless there has been obstruction to the circulation through the kidney, and interference with its function.

Syphilitic Ulceration of the Larynx.—Dr. S. W. GROSS presented the specimen, and read the following history of the case :—

E. W. S., 39 years of age, a plumber, of temperate habits and married, contracted chancre in 1857, for which he was treated with mercury, and which was followed, without being preceded by bubo, by secondary affections of the skin and throat, and finally, in about eight months, by ulceration of the tonsils and arches of the palate, the latter of which became ultimately firmly adherent to the posterior wall of the pharynx, so as completely to close the posterior nares. The bones of the skull became gradually affected, tender, enlarged, and exquisitely painful, especially at night and in damp states of the atmosphere. With the aid of the iodides, first of potassium, and, for the last twelve months, of sodium, the cranial suffering was kept in check, and the man was able, with occasional short intermission, to pursue his accustomed occupation. He was, however, remarkably susceptible to cold, and his appetite and strength not unfrequently failed him.

During the last three months of his life, he was much confined to his house, the osteocopic pains were very troublesome, and he now experienced great difficulty in his larynx, attended with occasional paroxysms of dyspnoea and of partial aphonia, the latter often continuing for days together. His countenance was wan and sallow, and his spirits were, at times, greatly depressed. A sense of uneasiness was complained of in the region of the stomach, but there was no actual pain or difficulty of deglutition at any period of the illness. The remedies which afforded most relief were iodide of sodium, with bichloride of mercury, and cauterization of the larynx with a solution of nitrate of silver, thirty grains to the ounce of water, every third or fourth day. Morphia and Dover's powder were frequently given at bedtime, and latterly, free use was made of quinia and milk-punch to support the failing strength. For the last week of his life, he suffered much from dyspnoea, and a sense of constriction in the windpipe; his debility greatly increased, but he was still able to be up, and was out two days before his death.

On May 17, he was suddenly seized with an aggravation of his laryngeal troubles, and when I saw him, four hours afterwards, he was tossing wildly about in his bed, panting for breath, exhibiting great difficulty of inspiration, and a peculiar whizzing sound, as if the air were passing through a narrow chink, as in oedema of the glottis. He became rapidly insensible, and expired in an hour after my arrival in a state of asphyxia. I would have opened the trachea, but had no instruments.

Twenty-four hours after death I examined the larynx, latterly the chief seat of the disease. The epiglottis was sound, but the vocal cords were thickened and indurated, and in such close contact as to leave hardly suf-

ficient space between them for the escape of the water that was poured in above. The sinuses were both greatly diminished in size; and on the right side, immediately below the vocal cord, was an ovoid ulcer, nine lines long and six lines wide. It was deeply excavated, with indurated edges, and covered by brownish aplastic lymph, and the mucous membrane in the immediate vicinity was much congested. The cricoid cartilage was materially thickened behind; and the laryngeal mucous membrane, of a pale ash color, was in a similar condition.

Aneurism and Calcareous Degeneration of the Aortic Valves; Spicule resembling Bone in a Branch of the Coronary Artery.

Dr. HUTCHINSON exhibited a heart, which had been removed from the body of a man, æt. 60, who had died after a short illness at the Pennsylvania Hospital. Very little history of the patient could be obtained, but he appears to have been in destitute circumstances, and to have sought and obtained work in a factory in the lower part of the city. While at work he was seen to fall, and was soon afterwards brought to the hospital in an insensible condition. The symptoms upon admission resembled those caused by serous effusion in the brain. The heart was carefully examined by auscultation and found to be beating feebly, but no murmurs were detected. Death took place about six hours after admission.

The autopsy showed that the aortic valve had undergone calcareous degeneration, and there was evidently constriction and insufficiency. In one of its segments was found a cavity containing coagulated blood. One of the principal branches of the coronary artery felt under the fingers as if its coats were converted into bone, but a closer examination showed that the calcareous matter was contained within the vessel itself.

The brain was somewhat softened and œdematous, and there was an effusion of serum into the ventricles and subarachnoid space. Embolism of the cerebral arteries was suspected, but no emboli could be found.

Dr. Hutchinson also called attention to the absence of murmurs during the last few hours of the man's life, notwithstanding the great constriction and insufficiency of the aortic semilunar valves, and attributed it to the feeble contraction of the heart.

Dr. STILLE said there was a fact of clinical interest and importance in this case, to wit, that, considering the form and degree of the lesion involving the valves, there should have been so feeble a murmur as the report of the case mentions. This case recalled a similar one which recently occurred under his own observation at St. Joseph's Hospital. A woman was admitted with acute articular rheumatism, and on examining her heart, a loud, rough, regurgitant, mitral murmur was heard. She had also a very frequent pulse and hot skin, and the heart was acting with very considerable force. Under an alkaline treatment during the day and opiates at night her condition improved somewhat more rapidly than was anticipated, and she became convalescent. When the fever fell, and the pulse had been reduced nearly to its normal standard, the murmur almost entirely disappeared, so much so that even when the patient was placed in the sitting position, it could scarcely be heard. She continued to improve. With returning appetite her strength increased, and the murmur returned, showing that our power of detecting a murmur at a given moment may depend upon the force with which the heart is acting. At one time, while it was contracting under the stimulus of fever, there was a rough murmur, which Dr. Stillé attributed to an old lesion. After convalescence was es-

tablished, and while the patient was still weak, it disappeared, because the force of the heart was insufficient to develop the murmur, but as her strength returned the murmur revived, and thus the judgment was confirmed, which was already based upon the quality of the murmur, that the valve was the seat of an old lesion.

Fœtal Monstrosity.—Dr. R. W. HARGADINE exhibited the specimen for Dr. Hillyer, and furnished the following account :—

The fœtus reached the end of the eighth month of gestation, and is about the usual size. The mother had an easy labour, the child being born before the arrival of Dr. Hellyer. It breathed about a half hour. The peculiar external appearances are these: The brain, attached by a pedicle to the posterior portion of the skull, hangs down the back as low as the middle of the dorsal region, covered by its thin membranes, through which the convolutions could be easily seen when the specimen was fresh. The skull is flattened, and there is *apparently* no cranial cavity. The eyes are very prominent owing to flattening of the orbits. The mouth is large and open, and the neck short and thick, giving to the fœtus that peculiar brute-like appearance so characteristic of monsters of this class. The body and limbs are well developed with the exception of the feet, one of which is clubbed. On removing the vault of the cranium, at least one-fourth of the brain-substance was found within its contracted cavity, in the shape of two long flattened lobes, one on each side of the median line. These were distinctly convoluted, and were connected with the extra-cranial lobes by a constricted band of brain-substance. Nearly the whole of the superior portion of the occipital bone together with the posterior arches of all the cervical vertebræ were wanting. The spinal cord began to curve backward about the last cervical vertebræ, and the medulla oblongata, pons Varolii, cerebellum, together with what appeared to be the two posterior lobes of the cerebrum, were entirely outside of the cranial cavity, and formed this pendulous tumour. The brain-substance being soft, and easily torn, the course of the principal nerves and the relations of the ganglia of special sense could not be traced, with the exception, however, of the optic and olfactory nerves, which, arising apparently from the intra-cranial lobes, took their usual course.

In regard to the vascular distribution, some abnormalities were noticed. The anterior cerebral arteries ran the whole length of the intra-cranial lobes, and came off directly from the basilar. The carotid divided into a number of branches which anastomosed with these, but no circle of Willis existed. Nothing abnormal was observed within the thoracic or abdominal cavities except the absence of suprarenal capsules, the most careful search for which failed to detect them.

The foramen ovale between the auricles of the heart was found nearly closed by an exceedingly thin crescentic-shaped membrane.

I would mention that absence of the suprarenal capsules has been observed by Vrolik and others, occasionally, in exencephalous and anencephalous fœtus. No microscopic examination of any portion was made.

June 24. Intestinal Obstruction ; Recovery ; Subsequent Death from another Cause.

Dr. STILLE exhibited the specimen, which consisted of a portion of gut which had evidently been the seat of intussusception. The lower portion

of the bowel was entirely healthy, but at the point of intussusception there was a depressed rim, surrounded by a certain amount of indurated lymph mixed with fat.

Horny Tumour of the Lower Lip.—Dr. S. W. GROSS presented a specimen of conical horny tumour, five-eighths of an inch long and one inch in circumference at its base, removed from the left lower prolabium, where it had existed for three years. The subject of the growth, John F., aged seventy-one years, eighteen months previously noticed a small, round ulcer at its site, which he ascribed to smoking a short, clay pipe, which he always held on that side. During this period, the ulcer, which was the occasional seat of sharp and shooting pain, remained stationary, and he did nothing for it. It then scabbed over, and the horny tumour formed so rapidly that, in three months, it was an inch and a half long, and resembled a cock's spur reversed. About once every four weeks he clipped the mass with scissors, having previously softened it by means of a bread-poultice, and even then he found it hard to cut. For the past three weeks, the lip at the root of the growth has been the seat of lancinating pain, which sent him to the clinic of the Jefferson Medical College on the 16th of June, when Professor Gross removed it. The horn itself was quite insensible.

Sept. 9. Traumatic Neuroma of Brachial Plexus following Amputation of Humerus.—Dr. WILLIAM PEPPER, in exhibiting the specimen, gave the following account of this case:—

The patient was a man aged forty years, who had served in the army during the late war. The amputation had been performed for a compound comminuted gunshot fracture of right humerus, which required the removal of the bone at its surgical neck. The amputation was a primary field operation, and was followed by rapid recovery with an excellent stump. Several years afterwards, symptoms of spinal disease made their appearance, and he died paraplegic in September, 1869.

On post-mortem examination of the parts, there was complete bony ankylosis between the head of the humerus and the glenoid cavity of the scapula. The humerus at the point of amputation was rounded off to a conical shape, and the end of the bone covered in by a thin layer of compact osseous tissue. All of the nerves of the brachial plexus, save the musculo-cutaneous, terminated in a neuroma, about three-quarters of an inch in diameter, which was adherent to under surface of humerus. There was a separate neuroma of small size upon the extremity of the musculo-cutaneous nerve. The brachial artery was obliterated for a short distance above point of amputation, and terminated in a fibrous cord, which was also inserted into the large neuromatous tumour. No examination of the spinal cord has been as yet made.

Dr. KEEN referred to the recent observations of Dr. W. H. Dickinson and Vulpian (*Amer. Journ. of Med. Sci.*, Jan. 1869) on this subject, and asked Dr. Pepper as to the cause of the ankylosis of the humerus. Dr. Pepper stated that the patient did not come under his observation until some time after the amputation; that during this time he was quite confident no inflammatory condition of the joint was present, and that probably the ankylosis resulted from want of use. There was also a certain amount of ankylosis in both knee-joints and one hip-joint.

REVIEWS.

ART. XX.—*Die Tuberculose, die Lungenschwindsucht und Scrofulose. Nach historischen und experimentellen studien bearbeitet.* Von Dr. L. WALDENBURG, Privat docent an der Kœingl. Universitæt zu Berlin. Berlin, 1869, pp. 560.

Tuberculosis, Pulmonary Consumption, and Scrofula; historically and experimentally studied. By. Dr. L. WALDENBURG, private teacher at the Royal University of Berlin.

“The progress of science resembles the course of a spiral. It advances continually by departing from the centre and returns in circle-movement ever again towards it. The short-sighted either observe only the advance and overlook the return, or, on the contrary, recognize only the circular motion and the advance escapes them. Science, however, presses eternally forwards, but is ever bound, in the mean time, by the limiting radius of human knowledge.”

DURING a period of progress more marked than any probably in the history of medicine, and at a time when the fundamental branches which underlie the therapeutic art are especially the subject of close reinvestigation, it was not to be expected that tubercle could escape attention. The diseases resulting from it, or attended by it, are too widespread in their prevalence, too frequent in their occurrence, and too fatal in their course to allow of the subject occupying a secondary position among those claiming the attention of the profession. There is, besides, the deep mystery which yet surrounds the origin of this pathological product, to add to the interest attending its study, because this origin is reasonably connected with the power to cure, or more certainly, with the power to prevent. It is a mystery yet hidden among the minute ramifications of artery, vein, and bronchiole, the changes of plasma and cells which attend the primary processes of nutrition, and not until we have solved it may we expect to control those diseases which now too often baffle our most persevering efforts.

The immediate cause of a renewed and eager study of the subject of tubercle within a few years past was the discovery of a remarkable fact in regard to it. We allude, of course, to the discovery of its inoculability by Villemin. He read his memoir before the Academy of Medicine, of Paris, in December, 1865, and the conclusions to which he arrived were such as to awaken the most profound attention. That tuberculosis is a specific affection—that it has its origin in an inoculable virus—that it belongs to the zymotic diseases and is allied to scarlatina, smallpox, and syphilis, and more nearly still to glanders—these are propositions which, if true, revolutionize all received doctrines, and compel the profession to study it anew. No wonder that Villemin's statements were received with “general distrust;” no wonder that the study was immediately commenced, his experiments repeated in every quarter and the results watched with the most eager interest.

To the impetus thus given to the study of the pathology of tubercle we owe the book whose title and motto are placed at the head of this article. The author's name has been heretofore, so far as we can learn, and certainly on this side the Atlantic, unknown to fame. It appears that he is editor of the Berlin *Klinische Wochenschrift*, and from a casual reference we find that he has previously published one work upon the subject of respiratory therapeutics,¹ which we now regret we have never seen.

However unknown the author's name may have been heretofore, we are much mistaken if it be not familiar in the future. In the composition of this work he has certainly shown most excellent scholarship and the greatest industry; it exhibits alike the close study and conscientious judgment of the historian, the patient exactness of the experimental physiologist and the careful reasoning of the philosophic physician. We are aware that this is saying a great deal, yet it is justly deserved; nor are we alone in our opinion as to the merits of the book, for very high authority has termed it "one of the most valuable and important medical works which has appeared for many years." In the historical portion the author presents the views of every writer upon the subject, from the time of Hippocrates down to the date of publication; he has gone to the original sources for his information and gives exact references to every author quoted. The mass of material at hand for this portion of the work must have been immense and the labour commensurate. The experimental portion exhibits the most scrupulous effort to exclude every source of error and to attain the truth regardless of any effect it might have upon past or present doctrine. Finally he states the conclusions to which his study of the subject has led him; that they are the honest convictions of an earnest student is apparent; that they are complete he does not claim; that they can be final in this transitive period of knowledge in which we live is scarcely possible. Nevertheless, he advances so many arguments in support of them, from experimental physiology, from pathology, from clinical observation, and from reason as to compel our attention. Possibly the near future may dispose of his theories as the past has disposed of so many others, and by enlarging the field of our vision reveal to us what he does not see, yet we cannot now afford to neglect his labours. The facts he presents will always be good, and the theories cannot but serve to help us forwards. If it shall be proved that all his doctrines are fallacious, and leaving his experimental researches out of view, still the skill with which he has traced a most complicated web of doctrine, the assistance he has rendered towards the attainment of a consistent nomenclature, and the clearness with which he has separated the known from the unknown would make his work a most valuable contribution to our science and demand from us a careful examination.

As before said, the verification or refutation of Villemin's doctrines was the author's starting point, and he confesses that he entered upon his task sharing the general distrust. This scepticism as to the inoculability of tubercle was speedily removed, however, by experiment, but he found himself forced to a very different interpretation and application of the facts. This led him to a study of authorities upon the subject, and he was immediately struck with the wide disagreement existing among them; views

¹ Die Inhalationen der gerstäubten Flüssigkeiten sowie die Dämpfe und Gase in ihrer Wirkung auf die Krankheiten der Athmungsorgane. Preischift. Berlin, 1864.

opposite, and even directly antagonistic, were held by writers, while from a different application of the same terms there had arisen the most bewildering confusion :—

“There reigned here a confusion such as is seen in few other branches of medicine. Besides the confounding of tuberculosis with pulmonary consumption, one author denotes by ‘tubercle’ a very different thing from another; what one calls tubercle is to the other nothing but the product of cheesy metamorphosis; what by this one again is called tubercle is by the other termed ‘granulation;’ a third calls both tubercle; finally for one of the parties the original term tuberculosis disappears entirely to be replaced by granular metamorphosis. A final union of the parties is now a pressing necessity if science is not to suffer serious injury from what is for the most part a verbal conflict.”

A glance at the accepted text-books in our language will show how true this is, and show too that the confusion has been made more bewildering by the attempt of those holding different views to designate one among the different substances known as tubercle as the “true,” or “real” tubercle; evidence enough that there has arisen a pressing necessity for a distinction being made. Nor do we find any greater harmony as to the nature of scrofula and its relations to tubercular disease. It is at once the cause of tubercle and the effect of the tubercular constitution; by some it is held to be something entirely different from tubercular disease, closely related to it by others, and by many they are looked upon as identical, and the terms are used synonymously.

To trace out the origin and growth of this confusion the author entered upon the historical study of the subject, believing this, too, to be the best means of removing so great a hindrance to further progress of the subject. How thorough and complete that study has been, we have already stated. But through this portion of the work it is of course impossible for us to follow him, although there is no lack of matter either interesting or instructive.¹ Still, enough must be gleaned from the historical portion to furnish us a clue for guidance through the labyrinth of conflicting doctrine, nor do we think we shall be performing needless labour for many of the profession in this country, if we present the views of the late German school upon this most important subject. Fortunately we do not have to go very far back into the past; “in ancient times and in the middle ages miliary tubercle was entirely unknown,” that important kind of tubercle—that which to most of the German writers and to our author *is alone tubercle*, is a discovery of very recent times. In the whole history of this subject it is astonishing how few doctrines need to be examined except those of teachers from whom the present generation of medical men learned pathology, and this gives to this portion of the subject the strong attraction of warm personal interest.

It was only with the rise of anatomy in the sixteenth and seventeenth centuries that progress in knowledge of tubercle became possible, and then it was made but slowly, and, as in other branches of learning, with long intervals of cessation and frequent periods of retrogression. Only slowly was the Hippocratic doctrine of ulceration and suppuration of the lungs abandoned; and an anatomical connection shown between vomicae, and those pulmonary deposits which were generally termed “tubercles” in the

¹ One fact too interesting to be omitted, is, that Addison taught a direct origin of the pus corpuscle from the colourless blood corpuscles, so lately experimentally established by Cohnheim. The reference is to Trans. of the Provincial Med. and Surgical Association, vol. xi. p. 247.

sense of "nodule," without reference to any special composition or structure, and sometimes "scirrhous" from their hardness; and only slowly was the fact established, that these are not diseased glands, imperceptible in health, but a pathological product *sui generis*.

Modern progress may be said to have begun with Stark and Reid; the former had been dead fifteen years, when the results of his labours were published by the latter in his work entitled "An Essay on the Nature and Cure of the Phthisis Pulmonalis," [London, 1785]. The service of Stark was the description and establishment in pathological anatomy of miliary tubercles, until then only incidentally mentioned and considered as of but seldom occurrence. They had been discovered by Manget, and a description published in 1700, but his labours had been entirely overlooked for nearly a century. To Reid is awarded the credit of having entirely separated scrofula from tubercle, and of settling the question as to tubercles being diseased glands.

Baillie was the next to make essential progress in our knowledge of tubercle. He taught the formation of the larger pulmonary nodules from a confluence of miliary tubercles. He did more—

"He separated already—and this is also an important advance beyond his predecessors—the nodules formed by a conglomeration of miliary tubercles from other deposits, which were later described as infiltrated tubercles, but which, until now, had been included in the term tubercle."

The substance of these deposits—the later so-called cheesy matter—Baillie declared to be "scrofulous matter," and considered it identical with the material of tubercle.

"With this acceptance of the idea of scrofulous matter, a new and essential point was gained for pathological anatomy—the *distinction of tumours and deposits according to the constitution of their substance*."

Baillie rendered another important service in describing the tuberculosis of other organs besides the lungs, as the liver, spleen, kidneys, and cerebral meninges.

Portal, who published his work during the French Revolution, did not add much to Baillie's facts, but made a great and important change in his names:—

"The steatomatous matter (our caseous), which Baillie calls scrofulous, received from Portal the name 'tuberculous.' With this designation, which, unfortunately, rapidly established itself, was laid the foundation for all the future confusion which reigned in the doctrine of tubercle, and which prevails in our day."

While "tubercle" originally meant a nodule, or a projection simply, without reference to composition, the term had gradually been limited to those nodules in the lungs having a certain resemblance to glands, and was afterwards applied to those nodules in other organs resembling the pulmonary. These nodules or tubercles were sometimes firm and hard, sometimes soft, steatomatous, and cheesy.

"While now there was all at once *one* condition of the development of these tubercles chosen out, that namely of a steatomatous or cheesy consistence, and designated as tuberculous, there was committed a *logical fault*, which was doomed to severe punishment. Logically this step should either not have been taken, or if taken then the term tubercle for the nodules should have been given up, and another name substituted for it. For thus was brought about the unfortunate condition that there were, on the one hand, tuberculous affections

that had not the slightest connection with tubercles, and, on the other hand, tubercles in a certain stage of their development, that is so long as they were firm and hard, that, strictly speaking, were not tuberculous. It would certainly have been better to have retained Baillie's designation of 'scrofulous matter,' although by it a connection with scrofula was assumed which had not been proved."

Bayle, the immediate predecessor of Laennec, whose "epoch-making" work appeared in 1810, is the next great labourer in the field. He first applied the name "miliary" to tubercles, first discovered them in the larynx and trachea, and, far more important, first pointed out that clinical and genetic connection between the affection of these different organs which all before him, even Baillie, had failed to see. Consumption was no longer a local disease confined to the lungs, but a general disease affecting the whole body—a chronic disease of special nature, and not depending upon inflammation of glands or lymphatics.

"In the clear demonstration of these facts lies Bayle's most important service, which will make his name immortal in the annals of science."

Bayle created then the tuberculous diathesis. He committed, according to our author, the error of Baillie and Portal: the softening and caseous change of the deposited matter he looked upon as pathognomonic of the tuberculous degeneration, whether the matter was in the form of nodules or infiltrated—the kind of matter was of more importance than the form; "tubercle loses its meaning of a nodule entirely, and in its place appears the 'tuberculous matter.'"

"What was gained thereby? In the place of scrofulous matter, was tuberculous, instead of scrofulous degeneration, we have tuberculous, with the open acknowledgment that the idea remains the same and only the names are changed."

Besides miliary tubercles, Bayle also describes miliary granulations which are distinguished from the tubercles by being transparent, shining, of the consistence of cartilage and do not soften, and which Laennec looked upon as the first stage of miliary tubercles, although their discoverer did not.

Bayle's doctrines in regard to consumption were also important; he recognized six different forms, all depending upon different diatheses: "He denied finally, that phthisis ever originated in inflammation of the lungs, of the pleura, or of the bronchiæ."

"Through all these, mostly radically new views, the doctrine of phthisis underwent a reform which must be considered as an almost complete overthrow of doctrines which had reigned for centuries, and as an entire change of heretofore reigning ideas."

Bayle's doctrines were continued with some modification by Laennec [1781–1826], and his authority was so great as to make what he taught the generally accepted doctrine down to within a very few years past. Indeed it is probable that Laennec's views still rule the greater portion of the medical world. His discovery of auscultation, his promotion of percussion, above all "the wonderful power he exhibited in so modifying and rebuilding the pathology of the thoracic organs as to establish a complete harmony between it and the new mode of physical diagnosis," were sufficient reasons for this wide-spread and lasting influence. He taught that the granulations of Bayle were only a primary form of miliary tubercle; his description of the change of the miliary into "crude yellow tubercle" is termed by the author classic; but according to him this crude yel-

low tubercle always originates in the same way, whether found as nodules—"isolated tubercle"—or in irregular masses—"tuberculous infiltration;" the term "tuberculous matter" was therefore applied to all forms, and covered all the stages of change of matters deposited in the lungs.

"It is remarkable that Laennec did not recognize the danger to science of the adoption of the term 'tuberculous matter.' While he represented by 'tuberculous' so complicated an idea, which did not accurately express *one* quality or condition, but extended to, and included a succession of various stages of development, every application of the word to a case logically expressed a series of suppositions and consequences which, for the special case, was very often not—and, strictly speaking, never—susceptible of proof. If, for instance, a cheesy deposit in any organ was termed tuberculous, the hypothesis was thereby involved that this cheesy matter had been first gray, and more or less transparent and hard, that it then formed a crude yellow tubercle, and that it finally softened and passed into a centre of ulceration."

"How much Laennec was under the influence of this conviction, or rather of this prejudice, we can best see by the fact that when he observed these cheesy deposits in cancerous tumours, he did not hesitate to designate them as tuberculous."

Passing now to consumption: Bayle had made six species of the disease; Laennec rejected all but the "granular" and the "tubercular," but as the granulations were, in his view, only an early stage of tubercle, there remained only one form of this disease. "PHTHISIS ALWAYS DEPENDS UPON TUBERCLE." This became a dogma, and has maintained its sway over the medical mind down to the present time. As a consequence, "PHTHISIS AND TUBERCULOSIS BECAME IDENTICAL."

So in regard to scrofula:—

"Laennec breaks entirely with the old doctrines concerning the relation of tubercle to scrofula. Scrofula, which until now had played so important a rôle in science, and which had particularly predominated over tubercle from its discovery, was sunk suddenly by Laennec to an entirely subordinate position. While until now the term scrofula had corresponded to the far more general idea, and tubercle appeared only as a species of it, the tuberculous diathesis was now raised to the more extended idea, and the scrofulous affections of glands became only a variety of it." . . . "The general idea of scrofula has dwindled, and, since an exact basis is withdrawn from it, threatens to wholly disappear. The place of scrofulosis is occupied by tuberculosis."

Wide-spread and lasting as Laennec's influence has been, his views found opponents even among his contemporaries. Broussais especially combated them; his doctrine of "irritation," as the great principle of pathology, led him to far different conclusions, and inflammation became again a cause of phthisis. "Tubercle, or rather tuberculous matter, is nothing but a product of inflammation." With both Laennec and Broussais phthisis depended upon tubercle, but with the former it was a neoplasm, with the latter an inflammatory exudation. We have seen over what wide changes Laennec extended the term tuberculous; Broussais applied it only to the cheesy matter; the isolated or nodular form lost its particularity. Out of this came confusion.

"Contemporaries and successors adopted the apparent agreement in the doctrines of the two great masters; they identified phthisis with tuberculosis, and accepted the tuberculous matter as the essential point of tubercle. . . . What is to be regretted in the contest of these two great men is not their opposition upon most important points, but, on the contrary, their agreement in uniting isolated tubercle with infiltrated by the use of the term 'tuberculous,'

and thereby establishing both as synonymous. In Laennec's and Broussais' doctrines was planted already the germ of the future division of miliary and isolated tubercles as neoplasms from the so-called tuberculous infiltration as a product of inflammation."

But the doctrines of Laennec found a far more formidable opponent in the great clinical teacher Andral, whose arguments were sounder than the hypotheses of Broussais. His great fault is stated to have been generalization from too limited a number of cases. His starting point was crude tuberculous matter, and not miliary tubercle. This matter he believed to have been originally fluid, and to have undergone a process of thickening; tubercle is therefore no longer a neoplasm, but a secretion product, and he inclines to the belief that it existed in the blood before being deposited. Pus, he says, he has more than once seen undergoing the process of inspissation, and changing into that form of matter universally termed "tuberculous."

"Andral knew then very well the process of cheesy degeneration, or, as it was at that time termed, 'the tuberculization of pus;' he describes, in the most precise manner, that form of inflammation which leads to caseous or 'tuberculous' products—those tuberculous deposits which, far from originating in gray, hard miliary tubercles, are nothing but thickened pus. By the establishment of these, in later times, ever more and more apparent facts, he earned the title of forerunner of Reinhardt and Virchow, and gave to Laennec's doctrines a most powerful blow."

He carried the application of his facts too far, however, in maintaining that all tubercle originated in this way. Laennec's "classic" description of the change from miliary tubercle into yellow he entirely ignored.

Another important doctrine of Andral's was, that the granulations of Bayle were circumscribed inflammation of the pulmonary vesicles, or "partial vesicular inflammations within the parenchyma of the lungs," a doctrine which, of course, removed them from all relationship with the tubercles of the pia mater.

"We see in Andral, consequently, that confusion which had been brought about by the introduction of the illogical term 'tuberculous,' already in full bloom. On the one hand, simple pus, when thickened to the consistence of cheese, is called 'tubercle;' on the other hand, the peculiar gray miliary tubercle is not tuberculous."

Into the particulars of his doctrines in regard to phthisis we cannot go, but give the summing up:—

"In accordance with this theory, and also sustained by practical experience, Andral held—with Broussais and against Laennec—that *inflammation, whether of the bronchial mucous membrane, of the lung tissue, or of the pleura, as well as hæmoptosis, may be considered as the most common cause of pulmonary consumption.*"

In support of Laennec's doctrines now appears Louis, who defines tubercle as the opaque cheesy matter—with whom "the original idea of tubercle as a nodule is entirely lost"—who denies, *in toto*, the origin of this substance in inflammation. His great influence established Laennec's doctrines upon a firm basis in France, but by no means ended the discord so far as other countries were concerned.

We do not deem it necessary, and it certainly is not possible here, to follow the various changes of the doctrines which now followed in Germany and England, however interesting it might be. Having shown, very briefly, how the confusion arose, and shown that there has been, in

the past, very high authority, practical as well as theoretical, for an inflammatory origin of consumption, we must pass over much that deserves our attention. In Germany the labours and doctrines of Meckel, Schönlein, Rokitansky, and Vogel, with the chemical researches of Simon and Lehmann, in England the writings of Alison, Addison, Carswell, and Clark, all contributed to the advance of the subject, although but few of them agreed either upon the minute pathology of tubercle or as to the origin of phthisis. Their differences and their agreements we cannot stop to point out, nor to indicate what each contributed which was new and valuable, but must hasten on to that latest period of the subject in which we live and take part.

The latest period in the doctrine of tubercle may be said to have opened with the microscopical study of the subject, and have reached its full development under the great teacher of cellular pathology. From 1841 to 1844 the investigations of Gluge and Lebert were published, and the appearance of the latter's prize essay in 1849—"*Traité pratique des Maladies scrofuleuses et tuberculeuses*"—placed the subject under the dominion of the microscope. The tubercle corpuscle became the characteristic sign of tubercle as the cancer cell was of malignant growths. Differing from every other physiological and pathological product, the red and colourless blood-cells, the pus corpuscles, etc., a certain and reliable means of deciding what was tubercle seemed at last to have been discovered. As these corpuscles are to be found in the affected glands of scrofula, the influence upon the doctrine was direct. But, we are told, Lebert was too good a *clinicien* and had had too much experience to be able to abandon the idea of scrofulous diseases as different from tuberculous; he therefore "held fast to the clinical idea of scrofula while he took from it all anatomical support." There is no scrofulous matter, but scrofula affects more the external parts of the body, and tubercle the internal organs. At that time, too, Lebert denied the inflammatory origin of tuberculous matter; now, we are informed in a note, he is inclined to consider not only tubercular infiltration, but tubercle as products of inflammation.

Scarcely were these doctrines spread abroad before they found not only opponents, but, according to our author, refutation, for Reinhardt in 1847 "proved" that the tubercle corpuscles may be formed from pus cells, and in an elaborate essay sought to prove that tubercle is in reality nothing but a product of inflammation. Further with his doctrines it is not necessary to go, for they were speedily overshadowed by those of Virchow; his wonderful powers were directed to the study of this important portion of pathology, and to the conclusions arrived at and doctrines taught by him we must give considerable share of our attention.

"In this condition Virchow found the doctrine of tuberculosis, as he began in this special subject as in all others of medicine, his epoch-making labours. It may be said that there existed at that time a contest of all against all; no principle was so universally recognized as not to be combated by facts; the confusion had reached its culminating point. Upon one side stood Laennec's theory, stoutly maintained with all its consequences by Louis; diametrically opposed to this were the doctrines of Broussais, Andral, and Reinhardt; Rokitansky's views resembled Laennec's, but with considerable modification of some important points; Lebert again presented Laennec's theory with other modifications; Engel agreed in some respects, but not entirely, with Andral and Reinhardt; Vogel stood midway between the contending parties.

"To bring order out of this general confusion Virchow was destined. It was clear that neither of the contending parties rested its claims upon mere

hypothesis; each of them was able to advance *facts*. But each party either ignored the facts of the other or nullified them by excessive scepticism, while from its own facts, the results obtained from a certain series of cases, it generalized beyond all bounds, and often followed them to the most extreme consequences."

Almost simultaneously with Reinhardt, in 1847, Virchow had proved that the cheesy matter, then universally designated as tuberculous, was not necessarily of a specific character, but was in many cases nothing more than *thickened pus*; that it may often be found even in the middle of malignant tumours, a fact already known, but wrongly interpreted—the microscope proved it to be in such cases a collection of *degenerated cancerous tissue*. He agreed, too, with Reinhardt in teaching that this "tuberculous" matter in the lungs of consumptives was very often the result of the inflammatory process—that it was undoubtedly inspissated pus.

"But happily Virchow did not arrive at the blind and too sweeping conclusion that therefore all tuberculosis was the result of inflammation, and to strike tubercle out of pathology as an independent formation. Rather recognizing on the one hand that the tuberculous matter might be an inflammatory product, he did not on the other hand surrender the old theory of Laennec, sustained as it is by exact observations, that primary gray miliary tubercles, to be considered as organized new formations, might also undergo the cheesy degeneration. The transformation into a tuberculous substance, as Virchow himself at that time termed it, or the 'tuberculization,' is consequently no specific process belonging to a certain dyscrasia, but a process which the most different pathological products, as pus, tubercle, cancer, etc., may undergo; it is *one of the various forms of retrograde tissue-destroying metamorphoses*."

In 1852 Virchow proposed a new nomenclature of the subject embodying the views just presented. Holding fast to the idea of tubercle as a nodule, not a nodule of any structure whatever, but one having all the special characteristics which had been described as belonging to miliary tubercles since the time of Bayle, he restricted the term to these bodies alone:—

"In short the term tubercle *must be restricted to the neoplastic miliary tubercles or granulations*. On the contrary, that which since the time of Bayle, Portal, Laennec, has been designated as 'tuberculous,' must—because according to the latest researches, it is only a condition of matter in a certain stage of pathological change, because it does not, as held by Laennec, originate entirely and alone in gray miliary tubercle or gray infiltration, but may be derived from the most various pathological products, and therefore is proved not to be specific—necessarily receive another name, and none can be better adapted to it than that already frequently applied, that which designates its characteristic consistence, and appearance 'cheesy.' 'Tuberculous matter' therefore becomes 'cheesy' or 'caseous,' and 'tuberculization' 'cheesy metamorphosis.'"¹

"With the separation of the two ideas of tubercle and cheesy deposit were the bonds finally broken which, since the time of Bayle, had restrained the free development of the doctrine of tubercle. Tubercle—i. e., the gray neoplasm which generally appears in miliary deposits—in its farther progress *may* undergo cheesy degeneration; indeed, this is the customary termination, but this process has no *necessary* connection with tubercle, for the tubercle may pass through other kinds of metamorphosis, it may undergo the calcareous degeneration and obsolesce, or the fatty and ulcerate. Just as little as tubercle is exclusively

¹ On a previous page of the history we learn that Craigie, in his *Elements of General and Pathological Anatomy*, Edin., 1848, proposed the Greek term "tyrosis" for this degeneration, and "tyroma" for the substance.

bound to caseous degeneration is the caseous degeneration bound to tubercle; the most various pathological formations, among other metamorphoses may undergo the cheesy."

The author regrets that these views of Virchow, in regard to tubercle and tuberculosis, have found so little favour even among his own countrymen. Of late, he says, they are rapidly gaining adherents, and Niemeyer especially applied them clinically. Niemeyer occupies a high position as a writer and practitioner, and ranks among the best clinical teachers of Germany. He divides pulmonary consumption into two groups, one depending upon miliary tubercle, the other the result of chronic pneumonia. He goes farther than Virchow, however; it is not only a certain kind of pneumonia which may cause phthisis, but every simple inflammation of the lungs may result in it. While it is chronic catarrhal pneumonia which most frequently leads to caseous deposit and consequent ulceration of the lungs, and this is the most frequent form of consumption, the acute catarrhal and the croupous forms, also, frequently end in phthisis. The phthisis resulting from miliary tuberculosis is, therefore, according to Niemeyer, the only form *not* dependent upon inflammation for its origin. He also restores to honour the doctrine of the ancients, that *phthisis may arise from hæmoptysis*.

"The real miliary tubercle causes phthisis only in the rarest cases; it is rather, in general, a disease resulting from ulcerative pneumonia—a complication of an already existing phthisis. *The greatest danger to a consumptive is that he may become tuberculous.* Many of the best-marked cases of phthisis run their fatal course without tuberculosis, so that at the *post-mortem*, in spite of great destruction of the lungs, not a trace of miliary tubercle is to be found."

The sketch we have given and the extracts made from these two writers, will serve to show the direction of the current of the doctrine of tubercle in Germany—there is a decided tendency to settle down to something near the doctrines of Virchow and Niemeyer. It is different in France; there a confusion reigns greater than any which has yet prevailed. To try to trace out the conflicting theories of the various authors would be here a waste of time. We can only say that the latest important work on the subject is that of Empis, published in 1865. He holds views which are in some respects different from any other authority, and his nomenclature only complicates and confounds, if possible, worse than before. Two articles of his creed, however, deserve mention: one is a belief in recovery from miliary tubercle—a belief based upon post-mortem examinations, and the history of cases which are presented in his work; the other is that *miliary tubercles are a product of inflammation*.

The condition of the subject in France, then, is briefly given as follows:—

"Among the latest writers upon tuberculosis, Cornil and Herard occupy nearly Virchow's ground. The majority of French physicians, however, yet follow Laennec and Louis, and especially Lebert. The old doctrine of Laennec has been, in the latest times particularly, brought into vogue by Villemin. Added to these are the adherents of Andral and Cruveilhier, and in this variegated company stands Empis with his new theories, almost isolated."

The author having finished the history of the subject, enters, in the second section, upon "The present condition of the doctrine of tubercle, phthisis, and scrofula." It opens with a discussion of the nomenclature—a running commentary upon the different applications of terms by various authors. Enough of this has been presented, we think, to convince every one of the necessity there is for reform in this respect. Uniformity in the

use of terms is an indispensable requisite for further progress. Laying down the undeniable propositions that scientific terms should be used with such precision that they can be applied to but one thing—that a name should not carry with it the idea of a process—that its use should not imply any theory of origin or development, he justifies the preference he has shown for the nomenclature of Virchow, by the facts that the term “tubercle” agrees with the original meaning of the term as a “nodule;” that the word “cheesy” should be used because it strikingly expresses the characteristic appearance and consistence of the matter, and is not new, but has long been used by writers on the subject; that, therefore, this nomenclature is in entire harmony with the pathological truth, and with the historical development of the subject. Its adoption would bring order out of confusion, and neither promote, interfere with, nor conflict with any theories. Besides, it has already gained considerable ground in the scientific world, while the latest nomenclature of Empis, of “granulations” and “granules,” only further complicates the subject, and has not been adopted to any considerable extent even in that writer’s own country.

The subject of this section—the present pathology of tubercle, as derived from the best authorities of the present day—deserves brief statement. First of the “granulations,” we have this paragraph of interest:—

“The term ‘granulations’ must be retained in science for a certain form of miliary neoplasms, which, it appears, are essentially different in character and development from the real gray miliary tubercles. It belongs to those fibrous or cartilaginous bodies particularly described by Andral, which are found on serous membranes, but also in the lungs, and which neither undergo cheesy degeneration nor, in general, softening. These bodies are colourless or clear gray, more or less transparent, and tolerably shining, often with black stripes running through them; of the size of lentils or millet seeds; generally rounded; mostly as hard as cartilage, in rare cases, however, softer; and are formed from fibrous tissue. Those found in the lungs are, according to Andral, with whom Virchow agrees, often only hardened lung vesicles. ‘Others are,’ according to Virchow, ‘indurated conditions connected with bronchitic and peribronchitic processes.’ The granulations have not, like tubercles and the cheesy hepatizations, a predilection for the upper lobes, but affect all parts of the lungs in like proportion. Whether we consider the granulations, not only of the lungs but of the serous membranes, with Andral, a result of the inflammatory process, or as simple fibrous neoplasms, and whatever their mode of origin, they differ from real miliary tubercle in their external appearance, and especially in their development; they remain as indurated points, or obsolesce and calcify, but do not become cheesy like tubercle. Whether these granulations depend upon a general diathesis, whether there may not be some genetic connection between them and miliary tubercles, upon what causes their existence depends, under what circumstances they arise, and what influence they exercise upon the general organism—these are questions which have not yet approached solution. The whole subject lies yet in entire obscurity.”

It is not necessary to describe minutely the miliary tubercles, since their characteristic appearance is given by every author, and, whether strewn through the organs or conglomerated together as “isolated tubercles,” they are well known. Microscopically, they are seen to consist of cells, with membrane, nuclei, and nucleoli; cells which “bear the greatest resemblance to the colourless blood-cells or the lymph corpuscles.” They are very variable as to size and shape, their figure undergoing change from external force, or possibly from an internal power of contractility, which is not, however, yet proved.

As to the point of deposit of tubercles in the lung, there is, as is well

known, wide variation of opinion among authorities. We, therefore, give what is said upon this point:—

“The seat of miliary tubercles in the lungs is, so far as it can with any certainty be made out, the alveolar walls, formed of fibrous and elastic fibres, or the interstitial fibrous tissue found between the pulmonary lobules and lobes. The smaller and finest bronchia are the chief points of origin—not, indeed, the epithelial membrane, but the layer of fibrous tissue immediately under the epithelium and the peri-bronchitic fibrous stroma—finally the walls of the vessels.”

“It is proved, thus far, that miliary tubercles, wherever they are found, have their origin in the fibrous tissue, or in tissues allied to it, osseous and lymphatic.”

The order in which the different organs are affected by miliary tubercle does not differ much from the well-known scale of Rokitsansky. Their appearance along the line of the bloodvessels has been especially remarked by many independent observers, and is a striking fact connected with them: the external coat (adventitia) of the smaller vessels seems to be a favourite point of deposit for them, and this may account for their frequent occurrence in the choroid membrane, while in non-vascular tissues, like cartilage, they are never found.

“Among the membranes affected by miliary tubercle the choroid coat of the eye has been shown, in the latest times, by Cohnheim, to be of especial importance; not only has their existence, in general, and especially in acute tuberculosis, been proved *post mortem*, but even during life their presence can be discovered by the ophthalmoscope [von Graefe, Franke, Lebert], and thus an important aid to diagnosis during life is afforded.”

The progress of the deposit of miliary tubercle is either acute or chronic. The former attacking simultaneously many organs, and running a rapid course, with symptoms much resembling typhoid fever. The latter spreading from the organ first affected, which is most frequently the lungs, and one deposit following another in succession and with more or less rapidity. In the acute cases the author deems it of the very first importance to look for evidences of a primary deposit from which the general infection may have proceeded. In the great majority of cases, when looked for, it has been found, and by such observers as Buhl, Rokitsansky, and Virchow. Such primary points of departure of a tubercular eruption—infection-deposits, the author calls them—need not, necessarily, be themselves tubercular, but may be of the pneumonic cheesy nature. This is an important point, one upon which he lays great stress, and of which we shall hear more.

It remains to state the further stages of development of miliary tubercle:—

Among the *certain* terminations is Rokitsansky's “obsolescence;” the tubercles shrink and dry, and remain as firm particles imbedded in the tissues, sometimes ossifying. Rokitsansky held this to be the only termination of miliary tubercle; according to the author, it is the most seldom.

According to Empis, miliary tubercles not rarely become fibrous, and the cartilaginous “granulations” are therefore to be considered as healed tubercles. Further investigations upon this point are “as necessary as important.”

Whether tubercle is capable of resolution, undergoing fatty degeneration and absorption, without affecting the tissue in which it lies, is not yet proved, although held to be possible by Virchow and Rokitsansky.

Direct ulceration of miliary tubercles is frequent, especially in the larynx; they soften and ulcerate without first undergoing cheesy degeneration.

But by far the most frequent termination of miliary tubercle is its transformation into the yellow cheesy matter. It is a remarkable illustration of the confusion of doctrine which has prevailed, that even upon this important point there has been wide diversity of opinion. Andral, Reinhardt, Empis, and Rokitsky are arrayed against this view, although not agreeing upon other points. But the change has been so conclusively proved by Laennec, that scarcely anything can be added by later times to his argument.

"To every one not under the influence of some theory, Laennec's explanation of the facts will appear the simplest and most impartial; while, on the contrary, that of his opponents will appear forced and formed to agree with a pre-formed hypothesis. But Laennec himself is not free from blame for the origin of this conflict, since he laid down the proposition that all yellow 'tuberculous' matter must have proceeded from the gray substance. It was not difficult for his opponents to meet this statement; there were palpable facts from which could be shown a direct origin of yellow tuberculous masses which had not previously been gray tubercle. But now these facts were too widely generalized, and the transformation of the gray into the yellow tubercle was denied even for those cases in which unprejudiced observation was obliged to admit it. For us, who no longer call everything which is cheesy tubercle, the original conflict has lost its early and principal importance. We are far from claiming that all cheesy matter has been formerly gray and must have proceeded from tubercle; we recognize fully the possibility of its having very various origin; but we must, also, as concerns real tubercle, maintain Laennec's doctrine in its fullest extent, that the gray tubercle, generally first in the centre, and then gradually towards the circumference, changes into the yellow cheesy tubercle."

This yellow tubercle, the product of gray, exhibits the microscopic appearances generally given—the tubercle corpuscles with finer elements, molecules and granules. The corpuscles have been proved by Reinhardt and Virchow to be "not primary formations but shrivelled cells." The difficulty of determining in every case what is really true tubercle and of distinguishing it from the product of caseous inflammation is admitted; it is a point which has been urged by Lebert, but because it is sometimes difficult we should not, therefore, generally, or whenever possible, make the distinction; in the early stages it can always be made, and, besides, "even if two processes yield similar or perfectly identical products, we are not thereby justified in considering the processes themselves as identical."

As to the further fate of this pathological product, its absorption has not been proved, is improbable, but, according to Rokitsky and Virchow, its possibility cannot be denied.

It very frequently undergoes cretification or petrification, and is either encapsulated or thrown off by ulceration, recovery being the result.

By far the most frequent changes, however, is softening. Yet in the changing phases of doctrine even this "unimpeachable fact" has not been left unassailed, and upon this point we quote a suggestive paragraph or two the bearing of which will be better seen hereafter:—

"It must, indeed, be confessed that the softening and ulceration of products resulting from miliary tubercle can be but rarely proved with *positive certainty*. If an ulcer or a cavity be found, and in its neighbourhood miliary tubercles, it is generally concluded that the softened and broken-down mass likewise resulted from tubercle. But how can the objection be met with positive proof that the

ulceration may have resulted from an inflammatory process, and that the miliary tubercles are only secondarily developed in its neighbourhood? Why do we find so extraordinarily seldom—according to some authors, never—softened and ulcerated tubercles in the serous membranes, if the termination is the ordinary one, while in the lungs and intestinal canal, where there is a possibility of another explanation, ulceration is so frequent?

“By most authors it is, indeed, now admitted that by far the majority of the cavities found in the lungs of consumptives are the result of caseous pneumonic processes. So too the intestinal ulceration may depend upon follicular inflammation, and the tuberculosis on its borders be a secondary process.”

There has always been a division of opinion among pathologists as to the point at which softening begins; one leading doctrine has been that it was the centre of the tubercular mass, another that it was in the tissues surrounding it. The author thinks the proof of the former irrefragible. Cruveilhier is the champion of the opposing doctrine whom he mentions, but it has been sustained among us by the high authority of Carswell. A microscopic examination of the softened tubercular mass, “which has been falsely called tubercular pus,” shows nothing but a detritus besides the shrunken cells called tubercle corpuscles. There is no growth of young cells—

“This circumstance forms an important proof against Cruveilhier’s doctrines and establishes the fact that softening does not result from a new cell formation but upon a necrosis and ruin of cells.”

Pus cells are only found when the surrounding tissue is affected or a bronchus has been opened.

By softening is occasioned a defect in the organ, an abscess with constant inclination to spread by new deposit of tubercle in its walls, and further breaking down of tissue. Yet with favourable opportunity for emptying itself externally an effort is set up towards repair, and cicatrization may actually follow. The author refers to Laennec as speaking of the very great frequency of such cicatrices being found, and to the statement of Cruveilhier that it is very seldom the lungs of adults and aged persons are found without traces of such healing process about the apices. In the historical portion he gives Carswell the credit of having particularly described the healing process of phthisical lungs, and says that “pathological anatomy has never given stronger proof of the curability of any disease than of consumption.” We may also here quote Bennett’s statement that “tubercle is arrested spontaneously in one-third of all the persons in whom it occurs.”¹

“Although we may admit that among these lung cicatrices and healings of tubercle by far the greater portion were the result of cheesy inflammatory deposits and not of true tubercle, yet it is, nevertheless, certain that tubercular ulcers and cavities may also heal. *I have been able to follow, by daily laryngoscopic observation, and, although relatively seldom, yet in single instances with certainty, the healing of tubercular ulcers of the larynx.*”

But the great point of obscurity in our knowledge of miliary tubercle is as to its origin, the great question of to-day, the answer to which pathologists are impatiently awaiting, is—“are miliary tubercles a new formation *sui generis* or a product of inflammation?” We have seen the difference of opinion among authorities; in opposition to the inflammatory origin stand Bayle, Laennec, Louis, Virchow; on the other side Broussais, Andral,

¹ Practice of Medicine, 3d Amer. edit., p. 183.

Cruveilhier, and Reinhardt; while Lebert, originally with the first party, has changed over to the second. The opponents of the inflammatory origin plead the peculiar character of the bodies, so different from any recognized product of inflammation; they adduce the frequency of their occurrence without a trace of inflammatory action, and look upon it when present as a consequence of the tubercle irritating the tissues like a foreign body. On the contrary, the other party holds the presence of inflammation to be the normal condition, and looks upon tubercle without it as evidence of a terminated process; they admit the peculiar appearance which likens the tubercle to neoplasms, but will not admit that this proves them not possibly of inflammatory origin; Andral and Reinhardt of this party claim to have observed the miliary tubercles in an early stage of existence, a soft gelatinous condition.

In view of the possibility of inflammation yielding products other than those usually recognized, of the obscurity which yet hangs over the process of inflammation itself, the author leaves this question here undecided, and, especially in view of Cohnheim's discovery, thinks the whole question as to tubercle being an exudation must be examined and discussed anew.

Having traced miliary tubercle through its changes from gray to yellow, the author next considers that kind of yellow matter, generally known as "yellow tubercle," which has a different origin—"cheesy products not originating in miliary tubercle." This kind of matter is not tubercle at all, a fact to be carefully kept in mind by the student who has followed writers by whom the yellow is termed "true" tubercle, and by whom no distinction is made between yellow matters having a different origin. That this yellow cheesy matter is not tubercle is now, we are told, a "recognized fact as uncontested as any other in pathology." Andral first showed that simple pus in old abscesses would undergo thickening and become "tuberculous"—*i. e.*, take on this cheesy consistence and appearance; Reinhardt proved that the so-called yellow tubercle of the lungs and other internal organs might have the same origin; Virchow confirmed these views, and showed that cancerous tumours and various other pathological products undergo the cheesy degeneration. The yellow cheesy matter generally described as "yellow tubercle" is not then tubercle, but is an inflammatory product—

"I will here only bring forward a single fact which bears with overpowering weight upon the whole subject. There are certain species of animals in which every simple abscess has the inclination to this cheesy change. At the head of these animals stands the rabbit. If we injure one of these externally with sufficient violence to cause suppuration, there collects at the injured spot a purulent deposit which seldom opens outwards, but remains encapsulated under the skin. If this abscess be opened it contains no fluid pus, but a more or less thick matter of cheesy consistence exactly resembling the yellow tubercular matter. That in this case we have to do with true pus and not with tubercle is without doubt, and needs no further proof. It is, therefore, a matter of course that every one who uses these animals for experiment in regard to tubercle should not only recognize this fact but distinguish between cheesy matter and true tubercle, otherwise almost every rabbit will be considered tuberculous."

The yellow matter is found principally in the lymphatic glands and in the lungs. The changes in the former from simple hyperplasia of the lymphatic elements, or from simple inflammation, are traced but need not detain us; externally, these affected glands are the sign of scrofula; internally, they cause "bronchial phthisis," or "mesenteric scrofula," but pro-

test is made against such terms as "tuberculosis" of the mesenteric or bronchial glands. In the lungs these cheesy deposits show a marked preference for the upper lobes; the larger ones are diffuse, non-isolated, have no nodular projections from their exterior, are often surrounded by traces of inflammatory action, and in general as well as in particular give no evidence of an origin by confluence of smaller bodies like miliary tubercles. So markedly is this the case that the term "infiltrated tubercle" has been applied to them by Laennec and other authors who have recognized the difference in form but not in essence. Yet the difficulty of distinguishing this matter from the yellow tubercle—the product of miliary—is acknowledged to be great; to ordinary examination it is impossible:—

"Also microscopically the appearances are strikingly similar; in the earlier stages of the cheesy hepatization the unchanged pus corpuscles scattered through the whole structure can be plainly recognized, but in more advanced stages of inspissation the pus corpuscles are, for the greater part, shrivelled into the same bodies which, in yellow tubercle, are known as Lebert's tubercle corpuscles. . . . If the process of retrograde metamorphosis be still further advanced, all criterion of a differential diagnosis is destroyed. The cheesy pneumonic deposits go through the same changes as yellow tubercle; at the best they can become cretaceous, but generally they soften from the centre towards the periphery, vomicae are formed which empty themselves externally, the softened masses are eliminated, and the cavities heal by cicatrization or by the formation of fibrous sacs."

But if the difficulty of distinguishing the larger cheesy deposits from tubercle is great, it is still greater in regard to the smaller which occupy the alveolæ of the lungs:—

"These alveolar deposits may be, like tubercles, very small, the size of millet seeds; also circumscribed and isolated, so that even the most experienced observer may be in doubt as to a decision. It may, with full right, be maintained that many of the principal authors have used these small cheesy deposits as patterns for their description of miliary tubercle, and yet they are nothing but thickened pus. The cheesy mass here fills entirely the alveolæ and the cavity of the smallest bronchia; frequently the matter may be pencilled out and the bronchial walls left free again. If gray tubercles are not to be found in the surrounding parenchyma, or more remote, the diagnosis is rendered easier; if, on the contrary, true tubercles are combined with these deposits the decision is frequently, in individual cases, impossible."

We must give now the author's nomenclature dependent upon these pathological views. Tubercle and cheesy pneumonia both cause phthisis or "consumption." There is a form of phthisis caused by miliary tubercle alone, uncomplicated with any cheesy deposits whatever; this is "*pulmonary tuberculosis*," and is "one of the greatest rarities," for the tendency to complication is great. Far more frequently is cheesy pneumonia alone the cause of phthisis, and attacks of it are "the beginning of the disease in the great majority of cases;" this is *phthisis simplex*. As soon as symptoms indicate that tubercular deposit complicates this form the term *tubercular phthisis* is applied to the disease. "In many cases a differential diagnosis can be made during life, may even be easy, and at least it is always useful to attempt it. In many cases, on the contrary, it is difficult or even impossible."

What are the causes of this cheesy degeneration, or *tyrosis*? (to use the Greek word, which, perhaps, had better have been adopted). The question bears very closely upon the etiology of scrofula and consumption, and is therefore of the highest importance, for it must be remembered that the

consumption dependent upon cheesy pneumonia is held to be by far the most frequent. In his answer to this question the author takes the ground that this tendency to tyrosis is a *local* rather than a *constitutional* affection. The constant result of traumatic irritation in rabbits¹ is admitted as a strong argument in favour of the constitutional view, but that in man there is ever a general tendency to cheesy degeneration of pus in whatsoever part of the body formed is denied. The tyrosis shows itself almost universally in the lungs; it is therefore local, and we are to look to local causes for its existence. An abnormal structure of the thorax and consequent interference with the function of the lungs may possibly explain this disposition to tyrosis, but the impossibility of pointing out the particular deformity is admitted. The narrow and constricted chests of consumptives must interfere with the flow of blood through the lungs, and the question is started whether a certain relative dryness, or want of blood in the parenchyma may not account for it. In connection the small quantity of water consumed by the rabbit, the scantiness of its urine, and hardness of its feces are commented on as facts possibly bearing on the point. He then considers Rokitsansky's doctrine, that cyanosis or venosity of the blood caused by mechanical affections of the circulatory and respiratory organs affords an immunity from phthisis, and the various instances are adduced. Traube, too, holds that diseases of the heart afford an immunity to caseous pneumonia, but only those diseases "in which the exit of the blood from the pulmonary veins is in great degree hindered and in consequence of this a transudation of the serous part of the blood into the pulmonary parenchyma is favoured." It is an important fact, too, that, on the other hand, a congenital constriction of the pulmonary artery gives a marked predisposition to pneumonia with cheesy deposits. Reference is given to other authors besides Traube, who have observed and noted the frequent connection of pulmonary consumption with stenosis of the pulmonary artery; they are Farre and Travers, in 1815; Gregory, 1822; Louis, 1826, and more lately, Frerichs and Lebert. From all the facts it appears that

"This combination is not an accidental one, but that in fact individuals affected with a constriction of the pulmonary artery, or of the mouth of the same, are markedly disposed to pulmonary consumption, while the percentage of those dying of this disease among those affected with this lesion is uncommonly great."

Among the cases of this kind reported there were twelve in which a high degree of cyanosis was present; consequently it cannot be the cyanosis which affords the immunity to phthisis; the hindered flow of blood to the lungs would rather seem to be the causative circumstance, and numerous instances are adduced to show that whatever favors a flow of blood to the lungs affords protection from consumption, and *vice versa*.

"The surprising rarity of phthisis among high mountains is explicable according to our hypothesis. By the influence of the lessened atmospheric pressure, and the increased lung action consequent upon ascending heights, the flow of blood through the lungs must be increased. These men easily acquire acute pulmonary inflammation, but the products of it, on account of the fulness of the lungs with blood, manifest but little disposition to undergo caseous degeneration."

¹ The author admits that abscesses, containing very thin putrid pus, are sometimes formed in these animals, but only when putrid matters have been introduced into the wound, or after great and long-continued irritation.

What is now the explanation of scrofulosis? Why do diseased glands in scrofulous persons undergo cheesy degeneration, while in healthy subjects they undergo resolution, or yield laudable pus? The answer shows a belief in a local rather than in a constitutional cause.

"Scrofulous persons have simple abscesses, with fluid pus close to cheesy lymphatic glands, and frequently enough pulmonary inflammations running a normal course, so that no general disposition to tyrosis is perceptible. This process remains limited to the lymphatic glands."

Scrofula, then, is a "constitutional anomaly in which the lymphatic glands have an abnormal tendency to disease, and possess a local disposition to undergo cheesy degeneration."

We may thus briefly sum up his doctrines upon cheesy degeneration, or tyrosis. It is a peculiar change, especially liable to occur in certain *parts*, as the lungs; its occurrence there is opposed by any malformation or disease of the chest, heart, or arteries which promotes a damming up of blood in the pulmonary parenchyma, and *vice versâ*. Certain pathological products are especially liable to undergo this degeneration, as tubercle, enlarged lymphatics, and the diseased intestinal and mesenteric glands of typhus; the cause of the change is local rather than constitutional.

"Wherever tubercle and the typhous glands appear, let the constitution of the individual be what it may, these structures will, from their own nature, undergo tyrosis, *i. e.*, the disposition to the degeneration is in themselves, not in the constitution of the affected person."

The questions which yet remain open in regard to tubercle, and especially in regard to the connection between it and caseous pneumonia, and the relation of both to scrofula, are numerous, important, and intricate. Some of them, it is to be hoped, may be solved by the information derived from the inoculation of tubercle; and to this subject the third section of the book is devoted. It opens with an historical sketch of experiments in this direction, and, German-like, begins with the first investigations made in studying the contagiousness of scrofula, and gives every step in the progress of our knowledge since, from the accidental inoculation of Laennec's finger to the latest investigations, and including all that has been done in the study of glanders, embolia, and other diseases. It is not necessary for us to go farther back than Villemin. The presentation of his memoir to the French Academy in December, 1865, marked, as before said, a new era in the subject, and not alone by the addition it made to our knowledge, but also by the new zeal and interest it awakened in the study of the subject, and which has already carried us far beyond the advance point then reached. In this memoir, and in a complete work¹ published in the winter of 1867-8, the following propositions were laid down:—

1. Tuberculosis is a specific disease.
2. Its cause resides in an inoculable agent.
3. The inoculation of rabbits from man readily succeeds.
4. Tuberculosis belongs, consequently, to the zymotic diseases, and should be classed nosologically with variola, scarlatina, and syphilis; better still, with glanders.

In making the experiments upon which these propositions are based, he used indifferently miliary tubercle and the infiltrated matter of cheesy

¹ Etudes sur la Tuberculose; preuves Rationnelles et Experimentales de sa Spécificité et de son Inoculabilité. pp. 640. Paris: Baillière, 1868.

pneumonia, calling both "tuberculous." But one important point remained yet incomplete. Villemin was justified in pronouncing tubercle inoculable, but it remained to be shown whether tubercle alone, and nothing but tubercle, would produce tubercle when inoculated. Our author says that he contented himself with but few experiments upon this point, and consequently laid down the doctrine that tubercle is a specific affection, most closely allied to glanders, producible alone by a virus, which must be inoculated, inhaled, or introduced into the system by contagion, and denied hereditary influence, constitutional disposition, pneumonias, catarrhs, and hæmoptosis as causes of consumption. To Villemin everything that produced tubercle by inoculation was tubercle; the caseous matter of pneumonia and of diseased glands gave successful results in experiment, therefore they were "tuberculous." But the range of his experiments had not been wide enough; a fact of prime importance had escaped him; one more interesting of itself alone, more influential upon doctrine, and more important practically than any with which he had astonished the scientific world. This fact is, that the inoculation of many other matters besides tubercle, matters of the simplest kind, and which must act mechanically alone, will produce tubercle. Its mere statement shows its importance; the wide field of inquiry opened is revealed at a glance; in the brief period which has elapsed since their publication Villemin's labours have become but a stepping-stone in our path of progress. We commend this striking fact to the careful consideration of those who, perplexed by the conflicting doctrines which have succeeded each other, and forgetful of the intricacy of the subject under investigation, have been tempted to sneer at the uncertainty of medical theories, as well as to those who, looking only at what remains yet unknown, would despair of further effort. Scarcely were the sheets which presented Villemin's discoveries to the scientific world dry from the press, before pathologists were submitting them to examination by experiments, which were varied in every possible manner, and by which the chief result obtained by him, the inoculability of tubercle, was confirmed, but his doctrines, in many respects, shown to be untenable, and great and unexpected additions made to them. In Germany, Lebert and Wyss; in France, Colin, who headed the commission of the Academy to examine Villemin's memoir; in England, Andrew Clark, Simon, Sander-son, and Wilson Fox, were the principal ones who followed up the work. The three latter fully established the important fact that not only the inoculation of matter other than tubercular would cause tubercle, but that a long-continued traumatic irritation, as a seton, also gave rise to it. Upon this fact Fox bases views as to the cause of tuberculosis identical with those which the author says he himself had published six months previously.

In the brief sketch of the important results gained by experimental inoculation, we have anticipated the subject so far as our author's labours are concerned. His own experiments began in January, 1867, first to test the specificity of tubercle set forth by Villemin, but continued with a rapidly extending plan as new facts were observed. They were so numerous, of such character, so well conducted, and with such results as fairly to rank him among those whose names have been mentioned, and to whom we are indebted for much important advance in our knowledge. The details of his experiments occupy over one hundred and fifty pages of the book; to attempt any detail of them is impossible here, yet some statement of their extent and character, and of the results gained, seems

necessary to an understanding of the concluding portion of the work. We will merely sketch them as they are classed in series.

FIRST SERIES: *Inoculation with fresh and softened gray miliary tubercle.*—Number of animals experimented on, 20. In 12 of these the inoculation failed entirely, a strikingly large proportion. Of the 12, 10 died in from two to ten days of septicæmia. In the 8 successful cases tubercles were found, and generally in more than one organ, and “tubercles that both macroscopically and microscopically showed the most perfect analogy with the miliary tubercles of man.” A critical examination of the experiments gives prominence to the following points:—

A lack of correspondence between the local and the general affection. In the best marked cases of tubercle in the internal organs, not a trace remained at the point of inoculation.

The necessity of a certain duration of life for the production of tubercle after the inoculation seems to be shown by the results; yet there is no constant relation of this kind, as the following series will show. Ten days may be looked upon as an unusually early period for the affection of internal organs, and “only in rare cases will the general affection take place before the third week.”

The successful cases followed, in by far larger proportion, the inoculation of softened tubercle.

SECOND SERIES: *Inoculation with the products of cheesy pneumonia and pus from the cavities of consumptives.*—Number of experiments, 5. Result negative, the animals dying in every instance within ten days, of septicæmia or pleuro-pneumonia. The limited number of this series is regretted by the author, but arose from the difficulty of obtaining inoculable matter from cases in which there was known to be no tubercular complication; but the possibility of successful inoculation of cheesy material has been meanwhile established by other experiments, as below:—

THIRD SERIES: *Inoculation with the non-tuberculous cheesy matter of lymphatic glands extirpated from a living person.*—These experiments were to afford a crucial test for the decision of the question, whether miliary tubercle could be produced by inoculation of cheesy matter alone, and certainly not tuberculous in the sense the word is used here. Septicæmia was not to be feared, and the objection of a post-mortem infection could not be advanced against them. Seven experiments: one died of pneumonia in fourteen days; two negative results; four not only successful but “brilliant.” In all the liver was full of miliary tubercles, in three the lungs also, in none was a single organ alone affected. The following points are impressed:—

Entire want of local affection to account for the general infection.

The impossibility of discovering any difference between the tubercles produced and those of the first series.

A frequency of success by inoculation of this scrofulous matter rather above that obtained with tubercle.

The destruction of all foundation for the objections that the results of inoculation are due to introduction of post-mortem matters, or to pyæmic processes.

FOURTH SERIES: *Inoculation with thickened pus from the inoculated point of an animal already inoculated either with tubercle or cheesy matter.*—This series was undertaken because, according to Villemin, the abscess forming at the point of introduction is tubercle; the author could see only, in the few cases in which it occurred, the thick cheesy pus which

always follows traumatic irritation in rabbits. According to Villemin, too, the local irritation bears to the general affection the same relation that chancre does to syphilis! Of the eight experiments, two were negative, and six successful. But besides mere success as to tubercle, other effects were produced which the author deems important.

In the two cases in which no tubercle was found, there was marked hyperæmia of the internal organs, generally with evident disposition to the formation of cheesy-purulent deposits; in one of them centres of hemorrhage in the lungs, fibrinous clots in the heart. In the six successful cases, in addition to the tubercles, there were evidences of internal inflammations—pericarditis, and myocarditis, swelling of cervical glands, and hemorrhagic centres in the lungs. In four of the cases, the miliary tubercles were found only in the liver, and it is remarkable that in two of these, not more than five days had elapsed since the inoculation.

"We believe ourselves justified, nevertheless, in direct consideration of the post-mortem results, in ascribing the liver affection to the preceding inoculation. *The diseased process in both these cases was evidently much fresher than we have ever observed it in any other cases. In the animal which died four days after the inoculation, the origin of the whitish nodules, here very fine, just visible points, could be seen in the plainest manner within numerous small circumscribed centres of inflammation or at least hyperæmic areas.* In the animal dying on the fifth day there were also extraordinary small white points present, but the inflammatory areola around them was much less plain."

FIFTH SERIES: *Inoculation with pathological products non-tubercular in character*:—

a. With cancerous matter. Five experiments, all negative, except the local results which do not concern us here.

b. Two experiments with the hepatized lung substance of a person who died of "croupous" pneumonia, and

c. Three with catarrhal sputa yielded negative results, the animals dying with symptoms of intense blood-poisoning.

d. Subcutaneous injection of pus. Three experiments with human furuncular pus; all died of pyæmia. Then to procure healthy animal pus, issues were made in a rabbit and a guinea-pig, and the pus of these used. Of three rabbits injected, all failed; of three guinea-pigs, all were successful, and showed "miliary tuberculosis of the lungs, liver, spleen, kidneys, and some glands in high degree." In two of these, the author feels assured that he found miliary tubercle in *process of healing*. It took place coincident with return of warm weather and green food, and increase of flesh and improved appearance followed the evidences of severe illness, as he has observed it to generally follow in animals on the return of spring; they had to be killed for the examination, and the evidences of healing were, a deposit of pigment in the neighbourhood of the lung tubercles, and in a cartilaginous change, or fibrous metamorphosis, while softening was not to be found in any.

"The larger cartilaginous, pearl-gray nodules are in every respect analogous to the granulations which are not seldom found in the lungs and in the serous membranes of subjects dead of any disease whatever, and which are often combined with true tubercles. From the result of the examination of these animals, it is in the highest degree probable, indeed even certain, that the cartilaginous granulations formed in them were healed miliary tubercles, and that consequently a cartilaginous transformation is one process of healing in tubercle."

These facts seem assured from the results of experiment thus far : —

Tubercle is produced, not merely by inoculation of tubercular and cheesy matter, but by introduction of matter certainly not tuberculous.

Successful inoculation, however, follows the introduction of miliary tubercle and the cheesy matter of lymphatic glands, much more frequently than other substances.

The development of the general tuberculosis bears no relation to the local effects of inoculation.

SIXTH SERIES: *Inoculation with tubercle and cheesy matter taken from preparations which had lain several months in alcohol.*—The results of such a class of experiments would, of course, decide the truth or falsity of Villemain's assumption that inoculation depended upon a virus, and that the inoculated material must be fresh ; they would also settle any question relative to inoculability depending upon a vital property, such as cancer-cells may be presumed to possess. The success attained was beyond expectation : of six animals one died without any result in sixteen days, all the others were markedly affected, and in most of the internal organs ; there was no local irritation at the point of inoculation, and no septicæmia excited. The fact was firmly established that the substance preserved for months in spirit was equally efficacious with fresh tubercle ; but to meet any possible objection which might be raised as to a chemical infection matter other experiments were made.

SEVENTH SERIES: *Inoculation or subcutaneous injection of tubercle or cheesy matter submitted to intense chemical action.*—The substance inoculated was submitted to the action of fuming nitric acid, boiling-water heat, or in some cases of permanganate of potassa or chromic acid. Of six experiments three gave a negative result ; of the three positive, the effect was limited, thus the lungs were free in all, yet other organs were sufficiently affected to establish the efficacy of the inoculation of matter thus chemically acted upon.

But from this series the author claims to derive very important support to his peculiar views. All chemical influence, all animal virus must have been destroyed, therefore

“The substances must have produced their effect alone by their structure, their unchanged morphological constitution of very minute elements. These elements, although changed by intense chemical action, retained, as the microscope proved, their external form, only somewhat shrivelled. Briefly expressed —*matter morphologically (or physically) the same, although thoroughly changed chemically, acts the same as the original matter.*”

This view being taken the negative results of this series become instructive. Thus in two of the experiments the substance from lymphatic glands was so acted upon by fuming nitric acid as to become almost entirely soluble, its corpuscular elements were entirely destroyed, and the results were negative. Another case in which the same substance was used the result was positive, but in this one an abscess with cheesy pus formed at the point of puncture.

“It is thus possible that not the inoculated substance itself, but the cheesy pus produced by its irritation, its particles being absorbed, causes the infection.”

Upon this failure of the inoculation of non-corpuscular, and success of corpuscular matter, however much changed chemically, he lays great stress.

EIGHTH SERIES: *Inoculation or subcutaneous injection of chemically*

changed non-tuberculous substance.—Four experiments, three successful, and with a success exceeding all others. The matter used was muco-purulent sputum of a person suffering from chronic pharyngitis, but otherwise healthy, thus with not a trace of tubercle or anything resembling it. The success was striking because the extent to which the internal organs were affected, and the different forms of affection, exceeded all other cases witnessed. Thus one animal had miliary tubercles in lungs, pleura, pericardium, peritoneum and omentum, liver, kidneys, spleen, lymphatic glands, heart, and pia mater; also cavities in the lungs, spleen, and in one lymphatic; one eye was affected with suppurative keratitis, iritis and perforation of the cornea, the other had miliary tubercles in the choroid coat. In another subject of experiment, were extensive cheesy hepatizations of both lungs, and with them miliary cheesy deposits. A good deal of space is occupied with the details of this series, and we can do little more than indicate the character of the results.

NINTH SERIES: Introduction of coloured substance.—This series was begun with the use of tubercular matter coloured so as to test the possibility of thus tracing it, and continued by the use of the colouring substance alone, and of these, aniline blue is by far better adapted for experiment than indigo or any other. This is the largest series of all, and we can only make a few extracts from the summing up.

“Glancing first over those experiments in which tubercle or cheesy matter was introduced in intimate mixture with aniline blue, the important fact presents itself, that in the miliary nodules excited by inoculation, the presence of the colouring matter was most evident. Since the aniline blue was not in solution, but in corpuscular form, so it is proved that such elements introduced into the subcutaneous tissue are carried to and deposited in the various internal organs.

“The vague assumption of some contagious juice which is absorbed cannot be made to explain the operation of tubercle inoculation, *but it is established that the inoculated elements as such, either by the lymph or the bloodvessels, can be taken up and carried to the different parts of the body.* It is further *ad oculos* demonstrated that the corpuscular elements of the inoculated matter are found in the artificially produced tubercle.”

Considering the objections that may be made, he nevertheless believes that—

“The corpuscular elements taken into the blood from the inoculated point are the only and true cause of the formation of miliary tubercles in the various organs.

“It is also established that the coloured elements found in the tissues have passed out of the bloodvessels, for they only could have arrived at the different organs by means of the vessels, either lymphatics or principally bloodvessels.”

TENTH SERIES: Inoculation or injection of blood.—These experiments consisted partly in subcutaneous injection, and partly of injection into the trachea, the blood being of healthy animals, and either fresh or boiled. They were undertaken to see if blood, other than that of a consumptive, might not produce tubercle, and in this seem to have been successful; also to investigate the influence of hemorrhages into the lungs. Besides the influence in producing tubercle, a decided tendency to intense inflammation with cheesy deposit, and to local pulmonary hemorrhages was manifested.

“The gray-white points and nodules within the hemorrhagic centres in the lungs deserve very particular attention; they are the beginning of miliary bodies—whether of inflammatory or tubercular nature remains undecided—which occur in company with extravasations of blood.”

ELEVENTH SERIES: *Traumatic irritations*.—Four experiments of this kind are given, all failures, yet he admits the positive results obtained by Sanderson and Wilson Fox outweigh any amount of negative results.

“Only this much may be probably justly maintained, that the production of tubercle by traumatic irritation is not a usual occurrence, but, when it occurs, must be considered a rarity.”

The brief sketch we have given will suffice to show the character, range, and results of the author's experiments, as well as to indicate the direction in which they are leading him. His summing up and general consideration will of course present his views more fully. The sources of error seem to have been carefully considered; he claims that by long-continued helminthological investigations and minute study of inflammation he has become familiar with every nodule and particle likely to be mistaken for tubercle; there are many such, most of them entozoa, and some have deceived experienced observers, so that he lays it down as an absolute rule that no body should be accepted as tubercle in these experiments until the microscope has confirmed the other modes of examination.

He considers at length the question, “Are the artificially produced nodules really miliary tubercles?” We shall not follow him because so many independent observers have arrived at the same conclusion, that the fact has been established, and the question needs no controversial examination. If Virchow, not only in private, but in his public lectures, accepts these bodies as tubercle, we may consider the question as definitely settled.

But are these tubercles really the consequence of the inoculation, or are they not rather accidental formations? This is an important query; one upon which hinges the whole subject. Those who claim that tubercle is of frequent occurrence in animals, are those who look upon the cheesy matter as tubercle; we have seen that the author is not one of these; he carefully distinguishes between the two substances, and he and all authors who thus distinguish do not believe in the frequent occurrence of tubercle in animals.

“A true miliary tuberculosis in animals either does not occur at all, or at least is one of the greatest rarities. Virchow declares expressly in his work on tumours *never* to have seen gray miliary tubercle in them, and scarcely any one has had greater opportunity for observation than Virchow.”

His own observation corresponds with this. In all the animals he has examined, looking out every nodule and point for parasites and entozoa, he never found miliary tubercle. Animals are termed tuberculous “from the confounding of terms already so much dwelt upon.”

Villemin kept his inoculated and non-inoculated animals in the same cage, and under perfectly similar circumstances; the one had tubercles, the others were always found healthy.

Farther, those animals inoculated by the author which died of septicæmia had no general tubercular infection; some of them certainly would have had, were their occurrence dependent upon mere accident.

The number of the author's experiments was 104, and there were used 71 rabbits, 28 guinea-pigs, and 3 horses. Of 100 experiments, 34 gave positive, 9 doubtful, and 57 negative results. Without going into particulars, we may give the following lessons of the percentage:—

“1. Inoculation with non-tuberculous and non-caseous substances, such as chemically changed catarrhal sputa, is not less successful than with tubercle

and cheesy matter; 2, inoculation of substances such as aniline blue, carmine, and blood, produces tubercle, but in general far more seldom than tubercle, cheesy matter, sputa, and pus; 3, that success is most seldom—in our own experience never—with simple traumatic irritation and carcinoma.”

The relative frequency with which the internal organs are affected is different in animals from man, the liver heading the list; thus the liver was affected 26 times, the lungs 21, the intestines 14, mesentery 12, spleen 11, kidneys and lymphatics each 10 times.

Re-stating the facts obtained by the experiments he asks the questions how these tubercles are produced? what *common element* is there in these varied substances to produce a common effect? It cannot be a virus, as Villemin held, for the substances are too heterologous; it cannot be a chemical property, or a contagious vital liquid.

“The common element is to be found most simply in their *morphological constitution*.

“All the substances efficient as inoculating agents agree herein, that, as shown by the microscope, they consist of very fine formed particles which are smaller, or at least not larger than the colourless blood corpuscles, that they thus consist of elements which can circulate with the blood without causing embolia or stoppage of the vessels.”

Looking at the facts—especially at the fact, indubitably proved, that coloured particles thrown into the subcutaneous tissue are found in the internal organs with tubercle—he cannot escape the conclusion that thus do the particles of all inoculated substances enter the blood, are deposited and cause tubercle.

“It is proved that the fine corpuscular element is as such absorbed and enters into the blood. It is farther proved that these elements are afterwards to be found in the various internal organs. Finally, it is proved that the artificially caused tubercle contains in itself the morphological constituents of the inoculated material.”

The first objection to this theory is that general tuberculosis follows the introduction of such substances as cotton wool, or a seton, as in Wilson Fox’s and Sanderson’s experiments, and the consideration of this leads to the statement of a very important part of his views:—

“In all these cases there was present a local suppuration as consequence of the traumatic procedure. This secondarily produced pus could be as well absorbed as the substances consisting of fine elements in the inoculated animals. There is therefore no proof against our theory in this, much rather may the results of these experiments be shown to be in harmony with it. In all these cases in which tuberculosis followed a pure traumatic influence there was a *self-infection*. We must thus far extend our theory: *that not only a foreign substance made up of fine particles, and introduced from without, can cause the production of tubercle, but also fine corpuscular elements present in the body, or abnormally produced in it, may have the same effect*. This very fact of self-infection is extraordinarily important in order to clear up the etiology of tuberculosis in man, as we shall see.”

Is tubercle an inflammatory product? This question was postponed, as we have seen, until it could be viewed by the light derived from experiment. Can it be answered now? To reply would necessitate an answer to another—what is inflammation? According to the author, we do not yet know the chief point of this process; seemingly settled but a short time previously as in the tissues, by Cohnheim’s discovery it has been carried back again to the vessels, and the whole subject once more thrown into “violent fermentation.” But Cohnheim’s discovery refers to the acute process

alone; how is it with the chronic, the products of which in some instances much more closely resemble neoplasms? The results of experiment differ; in some of the animals an exquisitely well-marked inflammatory areola surrounded the miliary tubercles, while generally these bodies show no trace of vascular action. Which is the beginning and which the terminating process? He is of opinion, that experiment will yet decide this question, and his suggestion to study the age of tubercle by injection of different colouring matters in succession at different periods of time seems well adapted to solve it. At present he looks upon the formation of tubercle as a process at least allied to inflammation—a deposit following an irritation and thus analogous to an inflammatory product.

“Looking upon tubercle, then, as an irritative deposit, wherein is to be found we would ask, the real essence of tubercle, that which to it is alone peculiar?”

“The characteristics of tubercle, in my opinion, are, besides the lymphatic character of its elements, 1, its occurrence in miliary deposits; 2, that these are not single or limited, but occur simultaneously in numerous parts. These two characteristics are derived from the etiology of tuberculosis. *The essence of tuberculosis consists in its being an absorption disease (resorptions-krankheit), which owes its origin to the reception of very minute particles into the blood, and the presence of these particles is expressed by the occurrence of numerous scattered centres of deposit.*

“We thus seek the characteristics of tubercle less in the single nodules, but much rather in the general character of the disease. According to this view, the single tubercles may be held to be products of inflammation or miliary abscesses; if only the general disease is made up of a general or at least a widespread occurrence of these miliary nodules of lymphatic character the essence of tuberculosis is assured.

“According to this view we can lay no weight upon a scrupulous separation of the true gray miliary tubercles from other miliary deposits, especially from those yellow miliary nodules whose origin from pus or from gray tubercle is uncertain. Nature knows no systems; she never draws the rigid lines which render artificial systems presentable. Everywhere in nature we find transitions, which are difficulties for the heads devoted to systems, but which are necessary that unity may be assured throughout her dominion.”

We are compelled to pass over many points of interest and proceed to the fifth section, the most interesting portion of the work: “The application of the results of experiment upon animals, to tuberculosis and pulmonary consumption in man.” That his theory may not be misunderstood, we copy his re-statement of it in the following formula:—

“Miliary tuberculosis is an absorption disease; it originates from the reception into the blood of very fine corpuscular elements, and the deposit of the same with consequent nodule formation in numerous scattered points of the various organs.”

“Tuberculosis is consequently a general disease; in a certain sense it is also a blood disease, but it is not a specific affection. It stands in nosological classification in the nearest relation to pyæmia of all other diseases, which is also a non-specific absorption disease. Pyæmia, likewise, forms scattered centres of disease through various organs, but they are larger than those of tuberculosis, and are of inflammato-purulent nature. . . . In tuberculosis, the elements are small and finely divided, and do not appear extremely irritating in character, wherefore, instead of pronounced or considerable inflammation, they give rise only to the formation of small miliary centres or foci.”

To the support of this theory he devotes the section under consideration, and his first argument is derived from the fact that other men, studying the subject as pathologists and clinically, have arrived at views and stated theories very similar to those which he has derived from experi-

ment upon animals. The particulars of these theories, both accordant and discordant, are given and commented upon. We can only briefly allude to them and their authors. The first is Buhl; he examined, of acute miliary tuberculosis, twenty-three cases, and in twenty-one of these found either cheesy infiltrations or cavities in the lungs; he has been led to look upon the latter as the cause of the tubercles, and calls tuberculosis "a specific absorption and infection disease." Hoffman has sustained Buhl in all except the specificity; he has proved that the cheesy deposits precede and cause the tuberculosis, and calls this "a disease consequent and dependent upon the accumulation of caseous detritus matters in the body." Dittrich's theory is said to have been more widely received; it attributes the disease to "the reception into the blood of the matters of retrograde metamorphosis, and a peculiar crisis produced thereby, especially an affection of the fibrous element."

Niemeyer has modified Buhl's theory in some important points, and his modifications approximate him nearer to our author. The quotations and references are to works of Niemeyer not so recent as are now accessible to the profession of this country. Since the seventh edition of his work on practice has been translated and published, we prefer to refer to that.¹ We will briefly state, then, that this eminent authority agrees with our author upon the following points:—

Hæmoptysis may occur without dependence upon tubercular deposit, either incipient or established; a contrary opinion is "altogether unwarranted, and fraught with danger to the patient."

Of all foreign bodies which, by irritation of the bronchial walls and air vesicles, give rise to consumption, the blood of a pulmonary hemorrhage most frequently has this effect.

A denial of the doctrine of Laennec that consumption is only of one form, and a distinct recognition of the fact that it is "much more frequently a result of chronic inflammation than of tubercular deposit."

The cheesy deposits, generally termed infiltrated tubercle, are not tubercular but products of inflammation.

The frequent coexistence of the two pathological products "suggests a causative connection" between them; "in a great majority of instances" the tuberculosis is a secondary process dependent upon the caseous deposit.

(That the caseous "infection-deposit" is not *always* found, is no proof, our author argues, that it does not exist, since it is found, when sought for, in so great a majority of cases.)

Predisposition to consumption is better expressed as "predisposition toward pneumonia, terminating in cheesy infiltration."

The origin of consumption in catarrh is distinctly recognized; "the wide-spread doctrine that consumption is solely dependent upon a diathesis" is "gratuitous and dangerous."

He thinks it "quite possible" that the danger of pulmonary tubercle from cheesy lymphatic glands will yet furnish an indication for the extirpation of all peripheral lymphatic tumours.

This support given to the author's views by others who have studied it in other modes, and which may be called the preliminary argument, having been detailed, he enters formally upon the statement of the proofs

¹ A text-book of Practical Medicine, by Dr. Felix von Niemeyer, translated by Geo. H. Humphreys, M. D., and Chas. E. Hackley, M. D. New York: Apoleton & Co. 1869. 2 vols. 8vo.

which are to be derived from 1, pathological anatomy; 2, pathology; 3, the etiology of the disease. These are three good pillars upon which to build any medical doctrine, and we must see if he can derive any support from them. Of course we can only select, in regard to each, some of the most important points.

Support derived from Pathological Anatomy.—Under this head we shall confine ourselves to acute miliary tuberculoses. We find first the statement that all pathological anatomists agree that in an immense majority of cases there exists somewhere, most frequently in the lungs, centres of cheesy deposit; from these centres the tubercles have evidently spread, and by some it is maintained that those nearest the infecting centre can be seen to be older than those at a greater distance.

He quotes from Rokitsansky, 1846, that this disease is but seldom primitive but generally secondary and dependent upon a previous deposit of tubercle elsewhere; and Rokitsansky is one of those who includes the cheesy matter in the term "tubercle." He quotes to the same intent from the same author under date of 1855.

He quotes Virchow likewise. This eminent authority says, "If we examine closely enough we find almost always somewhere a cheesy nodule of ancient date," which is to be looked upon as the centre of infection. Very seldom indeed does a miliary eruption occur without a pre-existing caseous deposit.

He alludes to Buhl's cases already given, and to five carefully examined cases in Pfeuffer's clinic, all of which were without exception.

In regard to acute tubercular meningitis he again quotes from Rokitsansky, 1844, that it is extremely rarely a primary disease, but dependent upon disease in other parts. He finds also, in the observation of Tröltzsch, that tubercular meningitis and even general miliary tuberculosis not rarely arise as secondary to purulent otitis, a strong fact in favour of his views.

The first *support derived from pathology* is the striking resemblance which exists between the course of acute tuberculosis and some of the "infectious" diseases, as typhus. "The clinical appearance of acute miliary tuberculosis is very often so similar to typhus that the differential diagnosis is impossible to the most experienced physicians."¹ In the one as in the other, there is evidence of a general blood poisoning, and the wide-spread formation of tubercles is like the eruption of an acute exanthema. This resemblance has been pointed out by clinical teachers who knew nothing of the recent experimental researches. The principal point for differential diagnosis has been heretofore the discovered presence of caseous deposits or cavities, and where none could be discovered our judgment could not advance beyond probabilities.

"Now, however, we have learned, principally through Cohnheim, an almost certainly reliable means of diagnosing general miliary tuberculosis during life by the ophthalmic examination of the choroid."

In regard to chronic tuberculosis he finds support to his theory in the different course and symptoms which consumption presents, which are sufficiently marked to justify division into three groups, readily recognized clinically.

¹ "The symptoms [of acute tuberculosis] are so very like those of typhus that the most experienced diagnosticians acknowledge to having met with instances in which a diagnosis between the two was absolutely impossible, and when patients dying with a diagnosis of typhus really had died of tuberculosis, and conversely."
—*Niemeyer's Practice.*

"Pulmonary consumption, as we have already explained, is not a simple disease—there are several forms of disease united under the term phthisis.

"The first form is the pure inflammatory, in which from beginning to end only the local processes of pneumonia, the cheesy thickening and softening of the products, are present, and true tuberculosis is entirely wanting. . . . For this form we think the name of 'caseous pneumonia' or 'pneumophthisis simplex,' best adapted."

The second form begins, like the first, with acute or chronic inflammation and cheesy deposit, consequent upon the absorption of which tubercles appear, first in the immediate neighbourhood of the deposit and then more remote. "This form we term 'phthisis tuberculosa' or complicated phthisis."

The third form begins with miliary tubercles, secondary to pleuritic exudation, or affection of the lymphatic glands, or some other cause, and is called "tuberculosis pulmonum."

Clinically, these forms may frequently be recognized; as yet our knowledge is not sufficient to enable us to do it generally; Niemeyer alone has attempted a differential diagnosis between different forms of the disease.

We quote from the remarks on the third form a few paragraphs bearing upon the diagnosis of the complication of tuberculosis:—

"A certain criterion of the presence of miliary tubercles we do not possess. Pathology must strive to discover such a criterion, so important for diagnosis and prognosis. Whether Niemeyer's view that miliary tuberculosis manifests itself by a more continued, and pneumonic infiltration by an intermittent or remittent form of fever will be established in the future remains to be seen, so much the more since Niemeyer himself admits that his investigations are not yet closed."

"The diagnosis becomes more certain as soon as remote organs begin to be affected. If to the other symptoms obstinate diarrhoea is added, or an ulcerated laryngitis sets in, the presence of a secondary tuberculosis is in the highest degree probable."

"A want of proportion between the severe general appearances and the relative slight local signs on the part of the chest is the most important point forming a diagnosis between miliary tuberculosis and caseous pneumonia."

He devotes still more space to *the support derived from etiology*. The tendency of his doctrine is, as we have seen, to carry back, so to express it, the constitutional part of the disease from a direct connection with the production of tubercle to an indirect one. Tubercle is secondary to certain diseases to which certain subjects have a constitutional proclivity. These diseases are therefore of chief importance, and first among them stands pneumonia. Another important point is, that the mode of production shown to be most general in animals—the introduction of matters from without—cannot be so in man, and *self-infection* must be considered the chief mode in the human race. The cheesy material, whether originating in true tubercle or a product of inflammation in pneumonia, has been shown by experiment to be the most certain to produce tuberculosis in animals, and the author looks upon the presence of this matter in any organ of the human body "as the most important and the most frequent cause of tuberculosis in man." Of all the sources of cheesy matter caseous pneumonia is the most frequent, and this is the principal cause of tuberculosis.

"We have already explained that it is not a true miliary tuberculosis, but a caseous pneumonia, which is the most frequent starting-point of consumption. So long as the phthisis depends upon a caseous pneumonia alone it must be considered a local disease. . . . As such phthisis may run its course to death or recovery without complication with tuberculosis. There may also

arise—and this appears to be the general course—a secondary tuberculosis from absorption of the cheesy detritus. This is limited, at least in the beginning, principally to the neighbourhood of the cheesy masses, or of the cavities resulting from ulceration of the same. But, sooner or later, it extends to other parts of the lungs, or attacks the pleura, intestinal canal, larynx, etc. This is the course of chronic tuberculosis or chronic tuberculous phthisis.”

Not only caseous inflammation of the lungs but of other organs gives rise to tuberculosis.

“I have not seldom had opportunity in my practice to see a laryngitis ulcerosa introduce the tubercular process while the lungs did not give the slightest physical indication of pathological change.”

“We might say that a recognized starting-point of tuberculosis is formed by caseo-purulent exudations upon serous membranes, as the pleura and peritoneum. It has been proved by innumerable observations that tuberculosis, after such exudations, is one of the most frequent diseases. Heretofore, the explanation of this and similar occurrences has been by the convenient and ever-ready phrase: the tuberculosis occurs by reason of the general cachexia. But why does the tuberculosis occur here and not some other cachectic disease? According to our experiments, we can now give up this explanation—made to help us out of our difficulty—and replace it with one more precise, by saying that in these cases tuberculosis is a direct result of the absorption of the cheesy pus.”

But in what relation to these caseous deposits, as cause of tuberculosis, stand the lymphatic glands which have undergone this peculiar caseous degeneration.

“In this manner is answered simply and satisfactorily our former question as to the relation of scrofula and tuberculosis. There is indeed an intimate connection between the two, an actual causative union; they stand to each other as cause and effect. *Scrofula can bring about tuberculosis by absorption of the cheesy lymphatic gland substance into the blood.*”

But there are other sources of origin of tuberculosis:—

“There is further an entire series of morbid conditions which have been looked upon for centuries as the causes of phthisis, and which have been thrown overboard only by the present time in it excessive scepticism and in accordance with the dangerous maxim: that which we cannot understand does not exist.”

“The ancients taught that phthisis occurred after suppression of customary secretions and discharges, whether of physiological or pathological character, after the drying up, for example, of blennorrhagias and eruptions of the skin, after rapid healing of long-standing ulcers and fistulæ, after sudden cessation of menstrual and hæmorrhoidal hemorrhages, etc. We will consider all these points further on, and try to prove that the view of the ancients was not an arbitrary one, but rested upon experience and observation, and deserves to be considered by moderns. In all the conditions given we maintain, in harmony with our theory, that by the sudden suppression or healing of these affections, in part abnormal detritus matters are absorbed into the blood, in part pathological products which for years were accustomed to be thrown off, are retained in the blood, and thereby tuberculosis is occasioned.”

Hæmoptysis, too, was with the ancients one of the most frequent causes of consumption, and so continued to be considered, until Laennec changed the doctrine and made it always a consequence and never a cause of tuberculosis.

~ “Also in reference to this point we find ourselves compelled to reinstate the doctrine of the ancients.”

“The ancients were excellent observers, and their collected experience de-

serves far higher estimation than we in later times unfortunately think good to accord to them. Unsupplied with the objective aids of physical diagnosis, they were thrown entirely upon the subjective symptoms of disease, and were therefore, in general, far more acute in searching for them than we who, relying upon the instrumental modes of investigation, treat the others as of minor importance. . . . Frequently enough have I convinced myself in practice, and could adduce the individual instances in proof, that very robust persons, in perfect health, at least without an abnormal symptom, have been suddenly attacked by hæmoptysis, and upon this had followed all the signs of phthisis. Nor did Laennec ever succeed in entirely establishing his doctrine; there were always, and even to our own times, influential opponents combating it."

That bronchitis may give rise to consumption the author firmly believes. The similarity of the early symptoms of the graver disease to simple catarrh, is good ground for the widespread and deeply-rooted general belief of this point in the minds of the people. His faith is founded upon a firmer basis, and the opposing explanation of Laennec, that the bronchitic symptoms depend upon tubercular disease, latent and not recognizable by physical examination, he terms an arbitrary assumption used as an after explanation.

He expresses himself in similar manner, but more strongly, as to laryngitis. Laennec held that the same relation existed between this disease and phthisis, as between bronchitis and phthisis, views which were opposed by Andral, yet which have held sway ever since.

"I began my observations as believing as possible, yet very soon many cases struck me, from the impossibility of harmonizing them with this dogma. For many years past, I have been convinced that this doctrine was not generally tenable. During many years I have devoted myself to diseases of the respiratory organs as a specialty, and have had abundant opportunity to see cases of commencing phthisis. Among these there have been many throat affections, in which the most minute physical examination failed to reveal even a trace of an abnormal condition of the thoracic organs. . . . In spite of the absence of lung symptoms these cases were very suspicious to me, and my prognosis was generally unfavourable. . . . Under my observation I saw not only the throat disease increase in extent and intensity, but symptoms on the part of the lungs gradually appear, dulness on percussion was perceived, and its increase followed, cough and dyspnoea followed, finally fever and death, with all the tormenting symptoms of lung and laryngeal phthisis."

To the objection that in these cases there was a latent tuberculosis, he responds: "Why should we prefer, out of respect for an hypothesis already undermined, to interpret afterwards by assumption of a latent condition of an objective something not susceptible of proof, instead of accepting as present what exact observation shows?"

That tuberculosis frequently follows suppurative inflammation of serous membranes, especially of the pleura, is claimed to be a fact accepted by all and denied by none. In the explanation the author of course differs from those who attribute it to the constitutional cachexia; with him it is a consequence of the absorption of the shrivelled pus cells and the detritus of caseous deposit. Purulent collections anywhere, especially if long pent up, thus become fruitful sources of tubercle; joint diseases, caries, and other instances are given with illustrative cases. Tröltzsch is again quoted, and his testimony given as to the frequency with which tubercular meningitis follows purulent otorrhœa.

The origin of phthisis and tuberculosis from the healing of old ulcers and fistulæ, and the suppression of discharges, is "not only denied by the moderns, but laughed at as a fable." Yet some of the best names in the

profession can be brought in support of the doctrine. Morton, Sauvages, Cullen, Portal, and Schönlein, are among the number.

"With what right do *we* presume so lightly and so inconsiderately to throw aside the observations of our predecessors and the experience of centuries? Do we attribute so slight powers of observation and so little strength of judgment to such men as Hoffman, de Haen, Portal, Autenrieth, Schönlein, and a hundred others, that they were not able to avoid the 'post hoc ergo propter hoc?' Is this piece of wisdom only an acquisition of modern times?"

In this strain he maintains the credit as careful observers and reasoners, of men who showed themselves to be skilful practitioners and good logicians even without the pleximeter, stethoscope, and all the appliances of modern physical diagnosis, and holds that an empirical science like medicine cannot afford to ignore their labours. Farther to sustain his views as to this cause of tuberculosis he refers to many authors, and gives cases of his own, especially in regard to the influence of healing anal fistula.

One or two other points remain to be touched upon: The influence of constant inhalation of foreign particles, as in the well-known "dry-grinder's rot," and the consumption of mill-stone cutters, is, of course, adduced as supporting the author's theory. He refers to his work upon *Inhalation* for full information upon this subject.

The direct hereditary transmission of tuberculosis he denies.

"I have carefully examined almost all the young of animals experimented with, whether born early or late, and I never found in any organ a trace of tubercle or anything similar."

Virchow has said the same. He believes then tubercle is always acquired, never congenital. The inheritance is indirect; it depends upon the transmission of a disposition to those forms of disease, caseous pneumonia and scrofula, to which tubercle is secondary.

The doctrine of the contagiousness of phthisis is favoured by the author. That it is highly so he admits is not possible, but the occurrence of the disease in those who have long and closely waited on phthisical patients is too frequent and too marked to be slighted. The medium of contagion he believes to be the minute particles expelled by coughing and respiration from the lungs of the diseased which, being inhaled by the healthy, produce first irritative catarrh, and lead afterwards to tubercular disease.

The prophylaxis and therapeutics of the disease are beyond the limits of the work, as indicated by the title-page. Nevertheless, in conclusion, the author gives a brief indication of the principles which should govern us in preventing and treating the different forms of these affections. He considers prophylaxis under two heads: that of the primary diseases—scrofula, phthisis, caseo-purulent inflammations, etc.; that of tuberculosis when the primary affections already exist. In the hygienic treatment of scrofula he has nothing new to offer beyond the rules laid down by good authorities already relating to food, clothing, exercise, good air, prevention of inflammatory attacks, etc., and extending from the earliest infancy to adult age. Upon one point we quote:—

"Great care is demanded in the vaccination of children disposed to scrofula. It should be undertaken only when the children are entirely well, and only lymph should be used which is perfectly clear and free from detritus and pus and blood corpuscles."

In a former part of the work he has considered the argument against vaccination advanced by its opponents, that it transmits scrofula. He

rejects it entirely, and assents to the correctness of the general belief that the scrofulous manifestations are only excited, and not caused by the vaccination; yet he thinks there is some ground to support the argument when the dried crust is used instead of pure lymph, and therefore warns against this practice.

We may repeat what we have said of the hygiene of scrofula for consumption, and make but few additions.

"Where circumstances allow, the growing children or youths should live, or spend some portion of every year among the mountains; the purity of the mountain air is curative, while the lessened barometric pressure, as well as the exercise of ascending heights, expands the chest and makes the lungs richer in blood."

"Bronchial catarrh in persons of consumptive habit should be treated as a serious disease; even when it is insignificant the patient should be confined to his room. If pneumonia or pleurisy occur, phthisis should be kept in view as a threatening eventuality, and should influence prognosis and treatment."

If any of the primary diseases which lead to tuberculosis already exist, our endeavours must be directed to prevention of this grave complication. The author admits that in the present state of our knowledge it is impossible to say why some persons can carry about for years cheesy deposits without tubercular complication while others rapidly succumb to the graver malady from an insignificant amount of the same.

In the treatment of diseased lymphatic glands he advocates decided measures.

"Easy as it may be, as a rule, to cause the disappearance of simply tumefied glands, even so vain is every attempt to cure those which have already undergone the caseous degeneration. Here the rule, which many surgeons have long since adopted, should be general, to extirpate such cheesy glands *in toto* as soon as they are accessible to the knife without danger. They should be removed entire from among the healthy tissues, and great care should be taken not to cut or crush them, or even to continue the operation with the knife which, perhaps for the purpose of examination, has divided them; not a particle of the cheesy matter should remain in the wound!"

In view of the frequency with which phthisis follows suppurative pleuritis every attempt should be made to prevent the thickening of the exudation.

"The only means of affecting this is paracentesis, which should be resorted to much more frequently than it is, and especially when we are convinced that the exudation is purulent, or when it remains longer than usual without undergoing absorption."

"Laryngeal affections, especially the ulcerations, should be submitted to a careful local as well as general treatment, and we should not content ourselves with the false and dangerous alternative: either it is phthisis, and then all treatment is useless, or it is a local ailment which treatment by internal means will cure, or if not cured at all is of little account."

"Fistula in ano in patients of phthisical or scrofulous tendencies should never be operated on; in strong robust persons it should only be resorted to when the inconveniences of it are very considerable, when it has not been of long standing, and after laying plainly before the patient the possible danger of the procedure."

We pass on to the treatment of phthisis and tuberculosis:—

"We must first of all once more emphasize the fact that the curability of phthisis is established beyond all doubt. Until the beginning of the present century scarcely any one denied it. Laennec already—not to mention Portal—reported a series of exact observations which proved the cure of phthisis. Cicatrices in

the lungs are so common that Cruveilhier, as we have seen, declared the healing of lung cavities to be one of the commonest occurrences. Only the excessive scepticism of our century has been able to deny this curability. . . . Happily the most recent period has begun to emancipate itself from this scepticism, which indeed also has rendered extraordinary service in the advancement of our science, and whose services and justification are therefore undeniable. Whoever observes without prejudice must be convinced that recovery from phthisis is far from seldom. And if we consider the several attacks of caseous pneumonia in the course of phthisis as completed diseases the recovery appears much more frequent. We are altogether too much accustomed to look upon consumption as a continuous disease; the idea that a person may suffer more than once of phthisis is foreign to us. Generally, however, it is not a single caseous pneumonia, but a succession of pneumonias at different periods of time to which the patient succumbs, while in the intervals he is entirely or relatively well.

"Viewed in this light, consumption is one of the most curable of the dangerous chronic affections, and its treatment is often to the physician a gratifying task. Compare it for instance with the chronic brain diseases, nephritis, carcinoma, etc.; how hopeless are these in comparison with it? Truly enough, if we are to obtain a satisfactory result, the circumstances of the patient must be such as to allow not only the following out of the most comprehensive medical treatment and dietetic regulations, but also the making of considerable sacrifices, such as travelling, change of residence, etc."

The therapeutics vary according to whether the case is one of cheesy pneumonia or miliary tuberculosis. If the former, in acute or subacute stages, a mild antiphlogistic course is indicated; local depletion, febrifuges, moderate diet. If these stages are prolonged, a better diet and strengthening measures are to be ordered in spite of the fever; after their termination more decided measures, such as the milk cure and cod-liver oil. The local treatment consists of measures to favour the elimination and expectoration of the cheesy deposits. "It is the remaining caseous matter and the cavities partially filled with detritus, which, so long as they exist, not only maintain the disease, but continue the danger of tuberculosis." Inhalations are beneficial, and more so in proportion as the trachea and larynx are affected; steam or vapour is preferred to atomized fluids, and he uses most frequently solutions of alum or tannin, or sometimes tar water.

"The most important measure in the treatment of phthisis, indeed the sovereign remedy as compared with all others, is climate. If it is taken advantage of early enough, and not, as unhappily is too often the case, when it is already too late, we may expect the best results from it. I have observed, and every physician as well as myself must have observed, the most cures of chronic phthisis from climatic influences; it is true many are but temporarily benefited, but sometimes there are perfect cures. Either the patient may remove entirely to a southern clime—the choice of place depending upon the individuality of the case—or he may spend several winters at the south. In summer let him pass his time among the mountains; the light atmosphere acts as a gymnastic for the lungs, and promotes the flow of blood through them."

The therapeutics of tuberculosis is far different—so short and sorrowful a story as scarcely to allow of mention.

"It is more than questionable whether we are able to limit a commencing tuberculosis by any means at our command. If we assume what is probable, that the tuberculosis, especially when occurring in a more or less free interval of a phthisis, manifests itself by a remitting or intermitting fever, we may maintain that in many cases we can control this fever. Frequently we can treat it successfully with quinia; in other cases where quinia has failed, I have seen unexpected good result from the administration of Fowler's solution. But whether with the moderation and cessation of the fever, the tuberculosis is

checked remains open to very just doubt. No less unreliable are other medicines of reputation in 'lung tuberculosis.' We may continue to try the customary measures, whey and milk cures, and mineral waters, as well as cod-liver oil, only observe whether they are of any use against true tuberculosis! It is not very different with climatic influences, although we may be allowed to expect more from these."

Nevertheless his observations upon animals show that there is sometimes a tendency to recovery even from miliary tuberculosis, and Empis formally adopts this view.

One measure of local treatment he looks favourably upon, although he does not recommend it in strong terms; it is the use of setons and issues. They were in high favour with the ancients, and he thinks he has seen good results from them. We mention this point because it does not seem to us to accord with the author's doctrines in view of the results obtained by experiment on animals of Wilson Fox and others. If tubercle follows any prolonged suppuration in animals, why not in man? If an otorrhœa or a carious bone is likely to produce it, why not a suppurating issue? It would seem as if the dry cupping and vesicants "with which, as palliatives, we have no reason to be discontented," are better.

The object we have had in view in preparing this notice of Dr. Waldenburg's work was simply to present his views with some indication of the arguments upon which he bases them. The task has not been an easy one, from the wide range of the subject and the mass of matter to be condensed within the limits of space at our disposal. Nevertheless the attempt has been faithfully made, and if in doing so we have trespassed upon the patience of our readers, the vast importance of the subject must be our excuse. If they gain from its perusal no new principles of treatment, even if no new facts are learned, it will not be without benefit to observe the attempt at progress which earnest workers are making, and to gain an idea of the "violent fermentation" the doctrines of tubercle and consumption are at present undergoing.

J. C. R.

ART. XXI.—*The Science and Art of Surgery. Being a Treatise on Surgical Injuries, Diseases, and Operations.* By JOHN ERIC ERICHSEN, Senior Surgeon to University College Hospital, and Holme Prof. of Clin. Surg. in Univ. Coll., London. From the fifth enlarged and carefully revised London edition. Illustrated with 630 engravings on wood. With additions. By John Ashhurst, Jr., A. M., M. D., Vice-Pres. of the Philadelphia Path. Soc., F. C. P. Phila. Surgeon to Episcopal Hospital, etc. etc. Royal 8vo. pp. 1228. Philadelphia: Henry C. Lea, 1869.

THE republication in this country of the fifth London edition (1868) of Mr. Erichsen's *Science and Art of Surgery*, with the valuable additions of Dr. Ashhurst, the American editor, cannot fail to be kindly received by the profession throughout our country. Occupying, as it does in Great Britain, the high position awarded in this country to the admirable *System of Surgery*, by Professor Gross, it has a peculiar claim upon our notice, as it embodies throughout not only the views of the Senior Surgeon to the University College Hospital, but those of his countrymen who have shed such lustre upon this department of the healing art. The perusal of the

work must confirm the opinions long since expressed, that Mr. Erichsen is fully competent to discuss the various topics embraced in his elaborate Treatise. Whether we regard it as a text-book for the medical student, or a guide for the practitioner, it deserves our highest praise. Every page bears the impress of the conscientious surgeon, and of the honesty of his conviction of the truth of his motto, borrowed from Lord Bacon, "That they be the best churgeons which being learned incline to the traditions of experience, or being empirics incline to the methods of learning." The previous editions of this work have met with the most favourable reception at home and abroad, and our author assures us in his preface, that he has spared no exertion to render the present worthy of the continued confidence of the profession, both as "a guide to the practitioner, and as a text-book for the student in surgery." He adds that the whole work has been remodelled, many of the wood-cuts re-drawn, and nearly one hundred new ones added. The chapter on Ophthalmology has been prepared by Mr. Streatfeild, while Mr. Berkeley Hill has rendered important aid in rearranging that on Syphilis. To Mr. Alexander Bruce he expresses his obligations for the assistance rendered in the various chapters relating to General Surgical Diseases, especially those on Pyæmia, Scrofula, and Tumours. Owing to the increase in the size of the work, the London edition was published in two volumes, but by the use of a greatly enlarged page, the American edition appears in one volume, "without omission or curtailment."

Mr. Erichsen, p. 86, justly remarks, "The study of the inflammatory process is one of the most complex and difficult on which the surgeon can enter," and were anything needed to corroborate this statement, it would be only necessary to peruse the thirty-five pages devoted to the subject in the volume before us. The author has not referred to the views of Cohnheim, which threaten to supplant those of Virchow; but as Mr. E. justly remarks, p. 87, the discussion of this subject belongs rather to the domain of General Pathology than to that of Practical Surgery, and cannot be consistently entered upon here, and we proceed at once to an analysis of certain portions of the work which pertain less to the speculative, and more "to the traditions of experience."

Gunshot Wounds.—The chapter devoted to this subject remains with but little alteration, as it was to be found in the fourth London edition, 1864, and we find but two or three brief notes of the American editor. At p. 148, Mr. Erichsen, in speaking of the conditions in which amputation is required, remarks: "Indeed, it may be stated generally, that all *compound fractures of the lower third of the femur*, occasioned by gunshot, require amputation." We feel satisfied, after abundant opportunities of observing and treating gunshot fractures of the femur, that a large number of those who served through our campaign would not assent to the doctrine which has so long prevailed, and which has been inculcated by our author. We admit that if the patient has to be transported over roads nearly impassable, and by conveyances which can afford no rest to the injured limb, amputation is the better alternative; but we do believe that if the patient can remain undisturbed, and his hygienic condition be made even tolerable, he will have an equal, if not better, chance of recovery without amputation, and especially if the wound be frequently cleansed with a solution of carbolic acid, permanganate of potassa, or of common table salt, the detached fragments of bone having been removed. We have seen so many instances of fatal results following

amputation, and so many of recovery, where a treatment similar to the above has been adopted, that we have no hesitation as to the course we should pursue if called upon to engage again in military surgery, or to decide the question in civil practice. Prof. Hamilton, in his excellent *Treatise on Military Surgery*, 1865, p. 397, states that he has seen in the various hospitals of the United States army many hundreds, "probably thousands of broken thighs under treatment, and a certain proportion of these had already united, making tolerably useful limbs." And yet on the previous page he remarks that he believed in these injuries conservatism had ruled too much, "and that amputations had been too little practised." In the new, third edition (1866), of his *Practical Treatise on Fractures and Dislocations*, at p. 490, he thus gives his prognosis in gunshot fractures of the thigh:—

"The same accidents in the upper third or the shaft of the femur are generally fatal; but if the main artery and the principal nerves are uninjured, the life is, in general, less hazarded by an attempt to save the limb, than by amputation. In the middle third, under the same circumstances, the chances may be considered equal, as between amputation and the attempt to save the limb by apparatus; in the lower third the chances are in favour of amputation."

If we mistake not, the testimony of the surgeons of the Confederate army is decidedly in favour of conservative surgery; and from all that has come under our observation, in civil and military practice, and whether the operation has been primary or secondary, we have failed to discover any material difference in the rate of mortality between amputation in the middle or lower third of the thigh.

Arterial Hemorrhage.—Under this head we find Acupressure fairly presented and illustrated, with valuable annotations by the American editor. It may be that our limited experience induces us to coincide with our author in his views of this method of treatment, but it does seem to us that he is correct in the following statement:—

"Indeed, it appears to me, that sound as may be the principle on which acupressure is based, in practice it cannot and need not be substituted for the ligature, but that it may be employed advantageously in conjunction with it, each method being applied to those vessels or in those cases to which and in which it seems most useful; and that the surgeon will act more wisely in being eclectic, rather than dogmatic, in the employment of his means for arresting arterial hemorrhage, in some cases using styptics, in others compression or torsion or the cautery, acupressure or the ligature, as the particular case seems to need it. Because one method is good, the others are not necessarily bad; because one is peculiarly applicable in one case, it does not follow that it is equally so in all." (p. 190.)

Our author does not believe that the ligature is the sole, or indeed the great cause of suppuration in wounds, and of the failure of union by the first intention.

"The constitutional condition of the patient, irrespective of anything in the local management of the wound, the want of homogeneity of tissues, and the very nature of the wound itself, have also a decided influence."

In a note, p. 189, the editor adduces proof sufficient to show that it is by no means settled in what manner the closure of arteries, which have been subjected to acupressure, is effected. He quotes Dr. Hewson in favour of the closure by adhesion, Mr. Bryant, of London, of an internal coagulum, while Mr. Lee and Dr. Lionel Beale attribute it to the organization of germinal matter derived from the blood itself.

Fractures.—Some sixty-five pages are devoted to the consideration of this subject, but we must limit our notice to but two or three. At page 235, it will be seen that our author is quite partial to the use of the starched bandage, which at first he did not think was a safe practice during the early stages of fracture, and before the swelling of the limb had begun to subside.

"During many years, however, I have followed Seutin's plan in some hundreds of fractures of all kinds, putting the limb up in the starched apparatus *immediately* after the reduction of the fracture, and have found the practice an extremely successful one, even in fractures of the thigh; so much so, that at the hospital I now rarely use any other plan of treatment; and, indeed, the more experience I have of it, the more satisfied I am with the results obtainable by it. I find that the moderate pressure of the bandages, aided probably by the great evaporation which goes on during the drying of so extensive and thick a mass of wet starch, and which produces a distinct sensation of cold in the limb, takes down the extravasation most effectually, and enables the patient usually to leave his bed about the third day after the injury, when the fracture is in the leg or ankle, and about the sixth when it is the thigh that is broken; so that we now treat all patients with simple fractures of the leg, and many with fractures of the thigh, especially children, as out-patients."

He adds that from no other means of treatment has he seen such satisfactory results in cases of fractured thigh, "patients having frequently been *cured without any shortening whatever* (*Italics our own*), with the preservation of the natural curve of the bone, and without confinement to bed after the first week."

The same favourable opinion was expressed by the author in the previous editions of his work, and as the doctrine taught in the above extract, viz., that in fractures of the thigh cures can be frequently effected without any shortening whatever, is one which is not generally accepted in this country, we are disappointed in finding no comments of the editor upon the above statement. Especially is this to be regretted in view of the numerous and vexatious trials for malpractice, which are so frequent, at least in the western portion of the United States. Prof. Frank H. Hamilton is entitled to immortal praise for the pains which he has taken to prove that, whether the treatment by immovable apparatus be adopted, or the more common method by extension with splints and weights attached to the foot, or the inclined plane, in the great majority of cases a certain degree of shortening and perhaps deformity cannot be prevented, and the same opinion is given by Prof. Gross in his *System of Surgery*, vol. i. p. 961. Again, at p. 870, while he speaks in the highest terms of the starch bandage, he differs from Mr. Erichsen most decidedly in reference to its use during the first ten days after the accident, after which he thinks there are but few cases in which its application will not be beneficial.

Prof. Hamilton also in the third edition of his work on *Fractures and Dislocations*, 1866, p. 56, in admitting the great value of the "immovable apparatus," whether made of starch or other material, in properly selected cases, thus remarks:—

"Whatever its advocates may say to the contrary, the simple fact is before us, that the number of accidents resulting from this practice is out of all proportion with any other yet introduced. I have met with them myself in all parts of my own country, and the journals abound with records of disasters from this source."¹

¹ Amer. Journ. Med. Sci., vol. xxv. p. 460, Feb. 1840; also N. S., vol. v. p. 212.

Our author disposes of the treatment of fractures of the middle of the forearm in five and a half lines, simply recommending the application of a splint somewhat broader than the arm on each side of it, and a narrow pad along the interosseous space. He directs also that no bandage should be placed under the splint. "If masses of callus happen to be thrown out across the interosseous space, the prone and supine movements of the hand will be lost, and the utility of the limb greatly interfered with."

Appended to the above brief description, we are glad to see a note from the editor, in favour of treating fractures of the forearm in the position of extreme supination as recommended by Mr. Lonsdale. We have long preferred this method, and believe that, by it, the patient is much more likely to retain unimpaired the prone and supine movements of the hand. As stated by the editor, "the position of supination by itself secures the interosseous space from encroachment;" hence there is no necessity for the narrow pad along the interosseous space, used by the author, and which is condemned by Mr. Lonsdale, Professor Hamilton, and others.

We have no space to examine, as we should like to do, our author's remarks under the head of Colles' fracture, and must pass on with the simple observation that both author and editor, in our opinion, have hardly done justice to the contributions of our countrymen upon this important subject.

At p. 282, Mr. Erichsen, in describing the various methods of treating fractures of the patella, seems to have had no personal experience in the use of the ring, the only notice of it being as follows: "Eve, of Tennessee, accomplishes the same object [holding the fragments together] by means of a ring passed around the fragments." Prof. Eve reported his success with the ring, attributing, at the same time, its introduction into practice to Dr. Gibson, of St. Louis, Mo., but as the writer has shown (*West. Journ. of Med.*, May, 1868, also *Amer. Journ. Med. Sciences*, July, 1868, p. 296), it is a very old method of treatment, having been abandoned for many years. In two cases we have thus succeeded in bringing about bony union.

Dislocations.—In the forty pages in which this subject is discussed we find many points worthy of particular study, and many which would constitute fair topics for criticism. For example, at page 291, we have the following unqualified statement: "The great obstacle to reduction is, the tonic contraction of the muscles inserted into or below the displaced bones." The "adjuster" invented by Dr. Jarvis is "a useful and powerful instrument for the same purpose," as the pulleys, in effecting reduction, while the method by manipulation, deservedly such a favourite in this country and with many of Mr. Erichsen's own countrymen, receives but little attention, either from author or editor.

In describing the symptoms of a luxation of the head of the femur upon the dorsum of the ilium, among others it is stated, page 317, that "when the patient is lying flat, with the knee slightly raised and advanced, the lumbar spine is on its proper level; but if an attempt be made to straighten the knee, so that the limb lies flat, the lumbar spine will arch forwards."

Now this latter test, Prof. Syme assures us (*Lond. and Edin. Monthly Journ.*, July, 1843, or *Am. Journ. Med. Sci.*, Oct. 1843, p. 461) is characteristic of luxation in the sciatic notch, and is never met with in any other injury of the hip-joint, whether dislocation, fracture, or bruise. Without attempting to explain the discrepancies between Mr. Erichsen and Prof. Syme, we may remark that, while we have had several opportunities of

determining the accuracy of this lumbar arch test, we have also satisfied ourselves that Prof. Syme is mistaken in supposing that it is characteristic of luxation into the sciatic notch. Long before the Edinburgh professor called the attention of the profession to this test, M. Jules Guérin, of Paris, had published a paper *On the Elevation and Depression of the Pelvis in Luxation of the Femur*, in the *Gazette Médicale*, No. 15, 1836. In this he maintains, 1. That in all the luxations of the femur upwards and outwards, the shortening of the luxated limb is greatly owing to the elevation of the pelvis; 2. The more complete the luxation, the greater is the elevation of the pelvis; 3. In old double or congenital luxations, the bending of the loins and the elevation of the pelvis forwards, are the consequences of the double ascent of the inferior attachment of the psoas and iliacus on the external surface of the ilium. M. Guérin goes on to show, what we have often seen, that in disease of the hip-joint, when the elevation or depression of the pelvis gives the appearance of shortening or elongation to the limb, the action of the psoas and iliacus is the cause of the phenomena.

In concluding our brief and very imperfect notice of our author's observations on dislocations, we beg to correct his statement, under the head of the accidents which have followed the attempts to reduce old luxations of the femur, page 321, that a fracture of the neck had occurred in the practice of the writer, is a mistake, or if it ever occurred, we have no recollection of the case.

Aneurisms.—None but those who have attempted the collection of the statistics of certain surgical operations, can appreciate the difficulty, and, indeed, we may say the impossibility of arriving at accurate results. The unsuccessful cases which have never been published, and the too careless manner in which cases, whether successful or unsuccessful, have frequently been reported, constitute obstacles which are truly insurmountable in our investigations of truth. Mr. Erichsen's table of cases of ligature of both carotids furnishes us with a good illustration in point. In the second London edition of his work (1857), Mr. Erichsen gave us but ten cases in which this operation had been performed, and two of these were followed by fatal results. In his fourth London edition (1864), his table includes seventeen cases, with four deaths. In the present American edition, we find a collection of twenty-seven cases, with six deaths; the number included in the table being the same as that published by Pilz, of Breslau, in the *Arch. für Klin. Chir.*, 1868. Prof. Gross, in his excellent *System of Surgery*, Philadelphia, 1864 (third edition), page 750, vol. 1, has a table of nineteen cases, with three deaths. Prof. G. has included, as did Mr. Erichsen in all of his previous editions, the case in which Langenbeck is reported to have tied both carotids on the same day, and both our authors have represented the result in Prof. Willard Parker's case as fatal. Prof. Parker's patient survived five months, and was under the writer's immediate care until his death. It can hardly admit of a doubt that he died in consequence of the extension of the malignant disease, for the arrest of which the operation was undertaken. Dr. Norris, in his most valuable paper on the ligature of the carotid arteries (*American Journal of Medical Sciences*, July, 1847, p. 13), places Langenbeck on the list of those who have ligated both primitive carotids, and yet by turning to the *Archives Générales de Médecine*, Paris, tome xix. p. 118, it will be seen that he tied the right superior thyroid, to arrest the growth of a pulsating goitre, and that in consequence of secondary hemorrhage from the seat of ligature

on the eleventh day, he tied the primitive carotid of the same side. The patient sank into a comatose state, and died thirty-four hours after the last operation. In a paper published in the *Western Lancet* (Cincinnati), September, 1855, we pointed out the above errors, and incorporated the same in a note on page 868, vol. 1, of our edition of Velpeau's *Operative Surgery*. In our table published in the *Western Lancet*, of twenty cases, there was but a single death, and that followed the operation performed by Dr. Mott with an interval of only fifteen minutes. Mr. E. has included in his table the cases of Ullman, Buenger, and the one in which Dupuytren and Robert operated at intervals of one, five, and thirty-six years. Prof. Gross, however, remarks, that "these cannot be adduced as legitimate examples of the effects of the ligation of these vessels, inasmuch as the brain had ample time to accommodate itself to the changes produced by the first operation before the performance of the second," a statement which certainly is not in accordance with the result in Dupuytren's and Robert's case, the very first in Mr. Erichsen's table, and in which the record thus reads: "Right carotid tied by Dupuytren in 1819; left by Robert for extension of disease [aneurism by anastomosis of scalp] in 1857. Delirium, hemiplegia of left side and death." Again, Professor Frank H. Hamilton reported, in the *Buffalo Medical Journal*, 1846, vol. ii. page 119, a case in which his brother, Dr. T. H. Hamilton, of Saugerties, New York, tied the right carotid, on a patient affected with epilepsy, August, 1838. The left carotid was tied in March, 1839, and notwithstanding "the ample time for the brain to accommodate itself to the changes produced by the first operation," the last was followed by palsy of the tongue, which lasted three days, and ophthalmia supervened in the left eye and destroyed it.

In Mr. Erichsen's table, we have the name of F. H. Hamilton, the distinguished professor, substituted for that of his brother, Dr. T. H. Hamilton; Reynolds (Case 20) for Rodgers (J. Kearney); and, strange to say, Mr. Longmore is accredited with the operation performed at the Confederate Hospital, in Richmond, Va., reported by Surgeon Williams, who was in charge of the division in which the patient was treated. This was communicated to the celebrated professor of military surgery at the Netley Hospital, England, by Inspector A. J. Semmes, M. D., and by Mr. L. published in the London *Lancet*, Jan. 23, 1864, p. 90. We feel satisfied that Mr. Erichsen has made another mistake in including the name of Velpeau on the list of those who have ligated both primitive carotid arteries, although at p. 644 he states that he was present at the first operation. "In a very interesting case which I saw in Velpeau's wards in 1839, both orbits were affected; and, as pressure on the right carotid arrested the pulsation and bruit in both, that artery was tied. But though the disease was cured in the left orbit by this operation, and temporarily arrested in the right, it reappeared in the latter situation, and was eventually cured here by the ligature of the left carotid." And in the table on p. 634, we find the following: "Velpeau—Age 29. Aneurism by anastomosis of both orbits. Right carotid first, Aug. 1839; left, about three months afterwards. Recovered." We avail ourselves of French testimony in reference to this case. The authors of the *Compendium de Chirurgie Pratique*, etc. (Berard, Gosselin, and Denonvilliers), vol. iii. p. 428 (*Mal. de l'Orbite*), after alluding to the singular effect produced by the compression of the right carotid on the tumour in the left orbit, and of the ligature when applied to that vessel, state that as several months

after the operation pulsation had ceased in the left orbit, and compression on the left carotid suspended the pulsations on the right side, Velpeau proposed to ligate the left primitive carotid, but to this the patient would not submit, preferring the tumour, as it gave him but little pain or inconvenience. Vidal, in his *Traité de Pathologie Externe*, etc., in 5 vols., Paris, 1855, vol. iii. pp. 356-7, gives the details of Velpeau's case, stating that the operation was performed in *July*, and by a singular coincidence, within three days of that performed by Jobert, for a tumour in the orbit. Vidal concludes his notice of the case by adding that, as the patient suffered so little from this disease, he would not submit to the second operation proposed by Velpeau, and which was strongly urged by other surgeons whom he consulted. It is added that in February, 1840, Velpeau examined the patient, and found him in the condition already mentioned. Vidal quotes from the *Dict. de Méd.*, nouv. ed., art. Orbit, Velpeau's explanation of the phenomena presented in this curious case. To Mr. Erichsen's table should be added the very successful operation by Professor Foote, of Cincinnati, which was performed for orbital aneurism, with an interval of four weeks, and the report of which was published in the *Cincinnati Lancet and Observer* for February, 1868.

At page 625 we find a brief, list of cases in which Mr. Wardrop's modification of Brasdor's method has been tried in aneurism of the innominata. The results in the four cases in this table in which the subclavian was tied, as Mr. Erichsen justly remarks, are not sufficiently favourable to justify the surgeon in repeating the attempt. No mention is made of the fatal result in our own practice, a notice of which was published in our edition of Velpeau (*op. cit.*), vol. i. p. 876. Prof. Gross has also mentioned it in his collection of these unpromising cases. Our patient died on the eighth day from hemorrhage caused by jumping out of bed. There was tubercular aneurism of the innominata and arch of the aorta, while the left carotid and subclavian were completely obliterated in consequence of atheromatous degeneration. Had our patient survived the ligature of the subclavian, we intended to ligate the carotid, in which case the patient would have been in the condition of the one reported by Rossi, of Italy, where the patient survived for six days, with a supply of blood to the head from the right vertebral, and perhaps some other branches from the subclavian on the same side. The results of ligature of the carotid on the distal principle for aneurisms at the root of this vessel have been more fortunate, and is deemed by Mr. E. a justifiable operation.

Mr. Erichsen's table of ligature of the brachio-cephalic artery includes 15 cases. He has omitted the operation accredited to Pirogoff, as well as the two reported in the name of Bujalski, as he "can find no details of these operations." Now the article on the subclavian artery in the French *Dict. de Méd.* in 30 vols., was written by Velpeau, who states that in August, 1840, M. Arendt, who had himself ligated the innominata, verbally communicated to him that Bujalski had operated in two cases, both patients surviving the operation only two or three days. On such authority we have a right to accept Bujalski's cases, making seventeen in all, with but one recovery, and that after the operation performed by Dr. Smyth, of New Orleans, in 1855. With such results Mr. E. thinks the operation "should be banished from surgical practice."

His table of cases in which the subclavian artery has been tied within the scaleni muscles, embraces 11, of which 10 died from hemorrhage, and 1 from pericarditis and pleurisy. We find that on page 647, as well as

in the table, p. 648, the name of Coles is substituted for that of Mr. Colles, of Dublin, who was, if we mistake not, the first to perform this operation within the scaleni muscles (1811). Again on page 646, we have a brief analysis of Dr. Smyth's *successful* operation, already mentioned, and, although Mr. E. states that it was performed for subclavian aneurism, on page 649 we find the following remarks:—

“Thus, it will be seen that, in every case in which an aneurism of the subclavian artery has been subjected to operation, whether by ligature of the brachio-cephalic, or of the subclavian itself *internally* to the scaleni, the result has been a fatal one. As this unfortunate termination to every case that has yet been submitted to surgical interference is in no way to be attributed to want of skill on the part of the operators—who have been, without exception, men greatly distinguished for the possession of this very quality—but is solely dependent on certain anatomical peculiarities in the arrangement of these vessels, by which their successful ligature has been rendered impossible, a repetition of these attempts, which may hasten the patient's death, can scarcely be considered justifiable.”

Surely, in view of Dr. Smyth's successful operation, Mr. E. should correct his assertion that “in every case” “the result has been a fatal one.” The American editor adds to the above denunciation of the operation, that “the single successful case of Dr. Smyth, of New Orleans, cannot be considered as controverting the correctness of the general rule, as stated by the author,” and at page 666, in speaking of ligature of the abdominal aorta, he expresses the opinion that in a case like Sir Astley Cooper's, where the sac had actually burst externally, it would seem but right to give the patient the faint chance that the operation might offer. And, in view of, as it would seem, the necessarily disastrous results of this operation in the seven cases in which it has been tried, it is difficult to appreciate the great difference in the feelings excited in the mind of Mr. Erichsen, and the editor, as they review the history of the ligature of the innominate and the abdominal aorta. At page 665 Mr. E. remarks:—

“It is impossible not to contemplate with admiration the man whose mind was the first to conceive, and whose hand was the first to carry out, the determination to apply a ligature to the abdominal aorta; and who, guided by pathological observation and physiological experiment, dared to arrest at once the circulation through the main channel of supply to the lower half of the body, trusting to the collateral circulation for the maintenance of the vitality of the parts thus suddenly deprived of blood. Sir Astley Cooper was the first to place a ligature on the aorta, in 1817,” etc.

A careful examination of the plates accompanying the report of Sir Astley's operation, in Cooper and Travers' *Surgical Essays*, Phila. ed., 1821, p. 104, together with his description of the case, inclines us strongly to the justice of Mr. Guthrie's criticism of this operation. At page 256 of his *Commentaries*, etc., 6th Am. ed., he remarks that, in his opinion, it will not be necessary to perform it, for when an aneurism has formed so high up that it prevents the application of a ligature on the side on which the disease is situated, the common iliac can be readily reached on the sound side of the body, very little more knowledge and dexterity, he adds, being required to pass over to the opposite or diseased side, and to ligate the artery above the aneurismal tumour, etc. “The placing a ligature on the aorta for an aneurism in the pelvis will thus be rendered unnecessary—a most important result, deduced from the operation described.”

As in Sir Astley's case, the aneurismal sac extended to, but did not involve the common iliac, we cannot subscribe to the statement of the

American editor that, in similar cases, a similar operation would be justifiable—Mr. Guthrie's method, in our opinion, holding out far better prospect of recovery. And preferable to either is the proceeding successfully adopted by Prof. Syme, in a case in which the tumour reached even to the bifurcation of the common iliac. Instead of resorting to "the desperate expedient" of tying the aorta, he opened the sac, and ligated the common internal and external iliac arteries, the hemorrhage having been completely suppressed by Prof. Lister's clamp over the aorta.¹ In Sir Astley's case, two students succeeded in compressing, with their hands, the aorta upon the spine, so as to arrest the pulsation in the right groin, and there can be but little doubt that, with the modern improvements in compressing the aorta, the circulation could be so controlled in a case like that of Sir Astley Cooper's, that the sac could be opened, and ligatures be applied above and below the opening communicating with it. The report of Murray's case, however, shows that it is not always an easy matter to ligate the common iliac from the opposite side.

At p. 616, Mr. Erichsen expresses his opinion on the treatment of femoral and popliteal aneurism by compression.

"After carefully considering the relative merits of the two plans of treatment, I think we may conclude that, though in some few cases neither ligature nor compression can be adopted, and amputation is the sole resource, yet in others compression can be employed when it would not be safe to have recourse to the use of the ligature; and that, in all ordinary cases of femoral and popliteal aneurism especially, compression should be preferred to the ligature, inasmuch as it is not a more tedious, and an infinitely safer, method of cure. At the same time, it must not be forgotten that its success depends very greatly on the continuous care bestowed upon the case during the progress of the treatment."

As to the tediousness of this method, therefore, Mr. E. is decidedly at variance with Prof. Syme, in his *Contributions to the Pathology and Practice of Surgery*, ed. 1848. After computing the average duration in 23 cases, "not of the treatment but of the actual compression, excluding the intervals of its discontinuance," at thirty-eight days, he thus exclaims: "Thirty-eight days and nights of misery to escape a few minutes of trivial uneasiness." Now, of 36 cases cured by compression in the London hospitals, Mr. E. states, p. 615, that, according to Mr. Hutchinson, the average time was only nineteen days; and as to the amount of "misery" endured by the patient, much will depend upon the "continuous care bestowed upon the patient." Indeed, by the combination of treatment employed at the present time, and which has been successful in our hands in several cases, the duration of the treatment is abridged, so that in many instances it has been successful in the course of a single hour, or in a few hours. We speak of the treatment by manipulation, flexion, or compression on the distal side, while digital compression is maintained between the tumour and the heart.

The American editor reported in the *Amer. Journ. of Med. Sciences*, January, 1868, p. 44, a case in which he ligated the femoral artery for an incipient aneurism of the right popliteal artery, the patient dying on the forty-fourth day of pyæmia. In commenting on this case, he remarks that the fatal result should not be charged to the operation, as the first bad symptom was not manifested until twelve days after the separation of the ligature, "when the patient was, *quoad* the operation, entirely out

¹ Vide Med.-Chir. Trans., London, vol. xlv.

of danger." In the account of the autopsy, it is stated that the "femoral vein contained a clot, unaltered above but softened below into a fluid of puriform appearance. The walls of the vein were perfectly healthy." We are told that the femoral artery was of unusual size, and that the popliteal portion of the vessel was dilated, "furnishing a good example of the very first stage in the formation of fusiform aneurism." Now we confess that, had the case occurred in our own practice, judging from the complete report, we should have felt a regret that we had not tried the treatment by flexion and digital compression, alternated perhaps with that kept up by instruments. We have, at the present time, a case of popliteal aneurism perfectly consolidated, in which the above treatment was continued for a month, with very little disturbance of the patient's comfort. We have reason to believe that, in our case, the disease was tubular aneurism, similar to that represented on p. 612, of Mr. Erichsen's work, and that the greater length of time required for its cure was due to the fact that it was accomplished only by the contraction of the sac, as well as by the irregular deposit of fibrine. In concluding his notice of the above fatal case, as well as one in his practice which had been successful after the ligature, the American editor expresses the opinion, with Prof. Syme, that the ligature should be employed in preference to any other means of treatment, as "deligation of the femoral artery in cases of aneurism, if performed sufficiently early, is a much less dangerous operation than has been generally supposed."

In the text, p. 670, Mr. Erichsen alludes to the statistics of Norris, that the mortality after ligature of the femoral is one in four, and to the still greater mortality following the same operation, in the London hospitals, it being, as shown by Mr. Hutchinson, at the rate of ten deaths in thirty-three cases. The dangers of the operation are well presented by Mr. Erichsen, and, we believe, are now fully appreciated by the profession, notwithstanding the extraordinary success which has been attained by the late Dr. Mott, Dr. J. Kearney Rodgers, Mr. Busk, of the Dreadnought Hospital, London, and by Prof. Syme. We do not believe, in view of the above facts, and of the brilliant results which have crowned the method of compression, that the majority of surgeons will concur in the following note of the editor, p. 616:—

"Ligation of the femoral artery, though not a difficult, is a very delicate, operation. If, however, it be done with due care, *when the aneurism is of moderate size*, it is, I believe, a much more successful operation than it is usually considered. For well-selected cases I cannot help thinking, with Mr. Syme, that it is the best mode of treatment."

The more correct doctrine has been laid down by Mr. Erichsen, p. 616, viz., that in all ordinary cases of femoral, and popliteal aneurism especially, "compression should be preferred to the ligature, inasmuch as it is not a more tedious, and an *infinitely safer* (Italics our own) method of cure." In this, we doubt not, the larger number of surgeons both in this country and Great Britain coincide, and the following extract from the *Rapport sur les Progrès de la Chirurgie*, made by MM. Denonvilliers, Nélaton, Velpeau, Felix Guyon, and Leon Labbé, and published under the auspices of the Minister of Public Instruction, Paris, 1867, shows that the above is now the accepted doctrine even in France. The writer, after referring to the labours of Malgaigne, MM. Broca (1856), Richet (1865), and Lefort (1864–1866), remarks that, during the past fifteen years, French surgery has materially changed its views in reference to the treat-

ment of aneurisms. Not that it has discarded the operation by ligature, but as this operation is liable to be followed by accidents of the most serious nature, it is reserved for grave and complicated cases; in a word, it should be the last and supreme resource. "So to speak, it has acquired a new responsibility; indeed, the circle of its application has been materially narrowed by ordinary cases; whereas, in those of a graver character and in which other methods have failed, it is the only remedy." (p. 551.)

The French reporter alludes to the fact that those who have published since M. Broca, have demonstrated the greater safety of the mode of treatment by compression, and that the duration of treatment is decidedly less than that required by the ligature. And to show in what favour compression has been received in France, he adds that, of sixty or seventy cases collected by M. Richet between the years 1856 and 1864, thirty-seven belong to French surgery. (p. 552.)

We regret that neither Mr. Erichsen nor the American editor has appended the views of Professor Syme as expressed in his address before the British Medical Association, at Leamington, August 3d, 1865, and which may be found in the *London Lancet*, Aug. 12th, of the same year, p. 176. We omit his remarks in reference to the ligature, which, in his hands, he regards as absolutely free from danger—thirty-five operations and all successful—and confine our quotation to what he seems forced to admit concerning the treatment by compression, for the revival and improvement of which, he adds, we are indebted to our Dublin brethren.

"There can be no doubt that by means of properly constructed apparatus, and with sufficient endurance on the part of the patient, aneurisms, and more particularly those of the femoral artery, may usually thus be remedied without any long delay. . . . The method by pressure therefore, while justly regarded as a valuable addition to the resources of surgery, should hardly be considered as a substitute completely superseding the operation."

A valuable addition to the resources of surgery! and aneurisms of the femoral artery may thus be remedied without any long delay! How great the change in the Professor's views since 1848. In his Contributions, &c., already quoted, he thus expressed his opinions:—

"The question between ligature and compression seems very much the same as that between passing a catheter, and puncturing the bladder for retention of urine. If the surgeon can with safety relieve his patient by means of the catheter, he should certainly do it. But if, instead of drawing off the water, he can only lacerate the urethra, and make false passages through it, his duty is plainly to thrust a trocar into the bladder. If it is in his power to afford relief by the catheter, he is bound to do so; and on the same principle, so long as it is my sincere persuasion that ligature of the artery is preferable to pressure for the cure of popliteal aneurism, I shall deem it my duty to pursue this method, though it may not, perhaps, be the best adapted for the lowest capacity of surgical practice. Puncture of the bladder, and compression of the femoral artery may be useful expedients when circumstances forbid the adoption of better means. . . . But it would surely be unreasonable to insist upon these clumsy, painful, and, I will add, dangerous methods of treatment being employed on all occasions, instead of those which, when properly executed, are easy, gentle, and safe."

Surely the Edinburgh professor must have gone to Leamington *via* "the sainted isle," and shared the fate of his illustrious compatriot, Prof. Pirrie, of Aberdeen, who went to Dublin in Oct. 1859, for no other purpose, as he declares (*Principles and Practice of Surgery*, 2d ed., Lond., 1860, p. 529), than to satisfy himself, by personal observation, of the

advantage of the "bloodless cure of aneurism." The result of his visit was the firm belief that the treatment by compression is a safe, simple, successful, and almost painless mode of curing aneurism. His interviews with his "Dublin brethren" satisfied him that in operative surgery, whatever "men dare, they can do," and he returned to "dear auld Scotland," cherishing the highest admiration of the talents and skill of the Irish surgeons. So marvellous a change in the views of the Edinburgh professor in the treatment of popliteal aneurism can be accounted for only on the supposition that in some way he has caught the "yippidemic" from his "Dublin brethren."

Syphilis.—The author in his preface acknowledges his obligations to his colleague, Mr. Berkeley Hill, for much valuable assistance in re-arranging the chapter on syphilis. At p. 519 we find, under the head of Constitutional Treatment, the following: "The *simple, soft, or excoriated chancre* will readily heal under the non-mercurial treatment; but, contrary to the opinion of many surgeons of the present day, I consider it much safer to put the patient upon a mild course of iodide of mercury." This shows plainly that our author has not the fullest confidence in the modern notions that the indurated chancre is the only infecting sore, and that after these sores have readily disappeared, the patient's "safety" from constitutional infection is assured. In this he accords with Prof. Gross (*op. cit.*, vol. i. pp. 285-6) and, indeed, with many others. In a review of recent works on syphilis, in the *British Foreign Med.-Chir. Rev.*, July, 1869, the writer has, in our opinion, well expressed the truth.

"Most observers are tolerably well agreed that there are two distinct kinds of sores, but it may probably be a matter of dispute for some time what are the essential and typical characteristics of each. Hitherto induration of the base of the sore has been held to be the distinguishing mark between the infecting and the non-infecting sore. But there is good reason to think that infecting sores are not always indurated; and, if this should be proved to be the case, we must find some other characteristic which shall be taken as typical—we must find some other mark which shall serve to show whether the primary disease will or will not be followed by secondary symptoms. At present we have no such diagnostic sign."

Still we are informed by the same writer at the commencement of his review, that there is perhaps no subject, within the range of medical and surgical practice, which has made more satisfactory progress during the last half century than that of the venereal diseases, and yet from the above quotations in reference to the infecting and non-infecting sores, we are even now compelled to accept the statement made by Mr. Lane nearly thirty years ago, in his lectures published in the *Lancet* for 1841-2, vol. ii. p. 594. We quote in point his graphic description:—

"The practical inference I wish you to draw from these remarks is, that a mere pimple, an excoriation, a vesicle, a pustule, a minute ulcer, one covered with a scab or not, a superficial ulcer, a raised ulcer, a deep one, one with or without induration, a spreading ulcer, phagedenic or sloughing, a stationary one, a cicatrizing ulcer, ulcers varying in form, in colour, size, or number, may contain, or have contained, the syphilitic virus, and, consequently, may be followed by the secondary or constitutional disease."

Mr. Erichsen, as we have seen, employs mercury in the treatment of simple chancre, and at page 529 he expresses himself in terms not to be mistaken, as to the great value of this agent, both as a prophylactic, and as

¹ *Vide Noctes Ambrosianæ*, New York, 1857, vol. iii. p. 147.

a curative means, "an antagonistic to the syphilitic poison," when the disease has passed beyond the so-called primary symptoms. Nothing can be more unlike than the therapeutic views taught by our author, and by Prof. Gross, and as the work of Mr. E. will be widely circulated as a textbook in our schools, we are glad to find a brief protest from the editor, who, at page 519, remarks:—

"The experience of American surgeons is decidedly in favour of treating the soft chancre or simple sore by local measures only, or if constitutional remedies be administered, such only as are indicated by the patient's general condition."

And again, at page 530, he adds:—

"Most modern syphilographers, whether unitists or dualists, acknowledge that the natural evolution of syphilis cannot be prevented by the use of mercury; and hence the administration of this drug for primary symptoms is now comparatively seldom resorted to. (See, upon this point, Cullerier's *Atlas of Venereal Diseases* edited by Bumstead, and review in the *American Journal of the Medical Sciences*, Jan. 1869, pp. 123-4.)"

We regret that our limited space will not allow us to notice the doctrines taught in reference to the transmissibility of secondary symptoms. We can only state, that they accord in the main with those inculcated by Vidal in his *Treatise on Venereal Diseases*,¹ and which was translated by the writer, who, in numerous notes, sought to incorporate additional evidence in favour of the transmissibility of secondary symptoms, as taught by the distinguished French author, and in opposition to the "immutable laws" laid down by M. Ricord. These "immutable laws" have yielded to the "irresistible logic of facts," and few indeed are found to defend them. With their illustrious master, we may now truly exclaim, "*Avec le temps la science à fait un pas*," and if any still entertain a doubt that the *annihilation* of many of these "immutable laws" has been a boon to society, let him carefully peruse an elaborate paper on "Prostitution in Relation to the National Health," *Westminster Review*, London, July, 1849, p. 82. (*Report from the Select Committee of the House of Lords on the Contagious Diseases Act, 1866; together with the Proceedings of the Committee, Minutes of Evidence, and Appendix, Session 1867-8.*)

Diseases of Bone.—To the brief but excellent remarks of the author on suppuration of bone, including osteo-myelitis, we find in reference to the latter an interesting and valuable note from the editor; we cannot, however, but express surprise that he has omitted to notice the elaborate article by Dr. Lidell, in the *New York Medical Journal*, March, 1867.

Excision of Joints and Bones.—To us this is one of the most interesting chapters in the whole work. The indications for excision and the conditions of success are distinctly laid down, and the best methods of operating well described. In enumerating, however, the indications for excising the shoulder-joint, such as disease and compound and comminuted fracture of the articulation, he forgets to mention the brilliant operations for bony tumours of Prof. Syme, and the late Dr. H. N. Bennett, as reported in this *Journal*, Oct. 1863, p. 385. In a letter received by the writer from the latter not long before his death, it was stated that at the time of writing (Oct. 1866), nearly five years after the exsection, the patient had almost a perfect use of his limb. We have had an interesting case of this kind in our own practice, as well as an exsection for compound luxation of the

¹ New York, 1854.

head of the humerus, which our author has forgotten to note as one of the causes which may lead to the operation.

Excision of the Scapula.—Mr. E. remarks that “the American surgeons have distinguished themselves highly in this department of surgery.” He erroneously gives to Prof. Syme the credit of having first removed (1856) the scapula, leaving the arm untouched. The operation of Langenbeck was prior to this, in 1855.

The editor has made a brief notice of Dr. Stephen Rogers’ paper published in this Journal, Oct. 1868. Dr. R. had collected fifty-six cases of excision of the whole, or greater part of the scapula, with the most gratifying results. The writer has had in his own practice three of these operations, two for caries and necrosis, and one for gunshot fracture, the patient recovering with an excellent use of the arm.

Excision of the os calcis should not, in the opinion of our author, be lightly undertaken. He has never excised it but once, having found in the eighteen or twenty cases which have come under his care that he could readily scoop out the whole of the carious bone, “leaving little more than an osseous shell.” This has left the foot as useful as ever for all purposes of support and progression. The writer has adopted this practice in several cases with the happiest results.

The remarks of both author and editor on excision of the head of the thigh-bone are replete with interest and instruction. The author justly observes (p. 780) that the operation is sometimes required to prevent the almost inevitable loss of life of the patient by continuance of hectic, and he believes that we should under such circumstances not be deterred from performing it, from the fear that we may not be able to preserve so useful a limb, as we do after excisions of the head of the humerus or elbow-joint. It is a question of life, and not of the perfection of the limb. The editor shows, from the extensive statistics he has collected, that in properly selected cases the chances of success are quite as good as after most capital operations—of 242 cases, 109 recoveries; and in 76 cases a useful limb was obtained. In the *Rapport sur les Progrès de la Chirurgie*, from which we have already quoted, made under the auspices of the Minister of Public Instruction in Paris, 1867, we find at page 633, the reporters, MM. Denonvilliers, Nélaton, Velpeau, Félix Guyon, and Leon Labbé, asserting that it is incontestable that excision of the knee and hip have for a long time been abandoned in France, and that they could cite only that of excision of the hip, performed by Roux in 1847. The writer witnessed this first operation in France, and the child, exceedingly emaciated at the time, sank exhausted within a few days after the operation. The reporters add very gravely that French surgeons probably attach too much importance to the contra-indications; that possibly they place too much reliance upon their skill in treating diseases of the joints; but they ask, Do not foreign surgeons unwarrantably multiply the indications for resections? That was the opinion expressed in the Academy of Medicine in 1861, by Velpeau, Malgaigne, M. Gosselin, etc. They then add: “Foreign surgeons themselves deny the advantage of resections. Syme, of Edinburgh, says M. Sédillot, maintains, with the sanction of many of his countrymen, that resection of the hip has never cured a single patient affected with coxo-femoral caries, and that the cases reported cured have recovered in spite of the operation, which contributed but to aggravate the condition of those who submitted to it.” And yet we are told in Sédillot’s *Contributions à la Chirurgie*, Paris, 1866 (*vid. notice in Brit. and For. Med.-Chir. Rev.*,

July, 1869, p. 94), that Sédillot now expresses himself in favour of this operation, and that he relates a successful case in his own practice. Maisonneuve, according to Dr. Suckley (*New York Journ. of Med.*, May, 1858, p. 353), had performed this operation in December, 1857. Dr. S. adds that the patient was a young woman suffering from morbus coxarius, and that in two months after the operation she was doing well, although much reduced by suppuration and long confinement. It seems strange that the above reporters should have overlooked this case. A case is also reported by Verneuil in the *Gazette des Hôpitaux*, No. 133, in which, in a similar case to that of Maisonneuve, the operation proved fatal on the fourth day.

But we must now bring our imperfect notice of the volume before us to a close. We do it with reluctance, as so much of interest and practical value remains; as, for example, in the chapter on ophthalmology, written by Mr. Streatfeild; that on diseases of the jaws and their appendages; on plastic surgery of the face; the treatment of harelip and uranoplasty, laryngotomy and tracheotomy; diseases of the breast; hernia; diseases of the rectum; lithotomy; diseases of the testis; ovariectomy, etc. etc. We have ventured to expose what we believe to be omissions and inaccuracies, and to criticize certain opinions, both of author and editor. But the great value of Mr. Erichsen's *Science and Art of Surgery* has been too long established to require praise at our feeble hands, and the annotations of Dr. Ashhurst, brief from necessity, on account of its already great size, nevertheless add to the completeness and excellence of the work. To the publisher much praise is due for the creditable manner in which he has issued this standard treatise.

G. C. B.

ART. XXII.—*The Mechanism of Dislocation and Fracture of the Hip; with the Reduction of the Dislocations by the Flexion Methods.* By HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery in the Medical School of Harvard University, Surgeon of the Massachusetts General Hospital, etc. etc. With illustrations. Royal 8vo. pp. 150. Philadelphia: Henry C. Lea, 1869.

DR. BIGELOW has devoted special attention to the surgery of the hip-joint for more than eight years, having read his first paper on the subject before the Boston Society for Medical Improvement in the month of June, 1861. He has since discussed the matter before the Massachusetts State Medical Society (in 1864), and before the American Medical Association (in 1865). In the present very handsome volume (which he still modestly calls a "paper"), he has systematically arranged the results of his eight years' study, adding references to cases reported by other writers, and embellishing his pages with fifty-two excellent wood-cuts, many of which are original.

The mechanism of dislocations of the hip has always been a puzzle to students, and we may add to practitioners also; and though of late years we have come to recognize, empirically, that these dislocations may be reduced by much gentler methods than were adopted by our predecessors; yet it is probable that no two surgeons could be found who would agree in every particular as to the mode in which their manipulations were ef-

fective. The chief point of dispute has always been, and still is, as to the relative share taken by the muscular and ligamentous structures of the joint, respectively, in producing and maintaining the luxation, and in assisting or impeding its reduction.

The advocates of the doctrine which affirms the efficiency of the muscles justly observe that, if these did not by their contraction maintain displacement, it ought to be as easy to reduce a dislocation without anæsthesia as with its aid; and in fact, in cases of young children (whose muscular resistance is feeble), anæsthesia is not essential; but, on the other hand, it may with equal justice be retorted, that, were the muscular structures alone effective in keeping up a dislocation, the use of ether or chloroform should abolish all resistance, and the surgeon ought then to be able to slip the head of the bone in or out of the socket at will—a possibility which every-day experience disproves.

Hence the true state of the case is, we think (and this our author seems to acknowledge), that while the ligaments of the joint are chiefly concerned in the mechanism of dislocation, the surrounding muscles add greatly to the difficulty of reduction, not only by their contraction, under the influence of the patient's will, and by their tonic contraction or passive force, but by an absolute spasmodic contraction to which they are excited by a reflex process, which is in no degree under the control of the patient, and which, in the case of a vigorous adult, can best be done away with by inducing profound anæsthesia.

The muscular impediments can therefore be removed by using ether or chloroform; the ligamentous obstruction to reduction can only be removed either by violent stretching or tearing, as was not unusual in the days of pulleys and Jarvis's adjuster, or by eluding the resistance by manipulation judiciously applied, relaxing the tense fibrous bands, and gently, and on simple mechanical principles, restoring the displaced bone to its proper situation.

To understand, then, how to effect reduction by manipulation, it is necessary to comprehend the nature of the ligamentous obstructions, and how they are to be overcome. This matter has been closely investigated by Dr. Bigelow, his attention having been, in the first place, directed to it almost accidentally (p.10), and we must in candor say that his explanation appears to us more simple and more reasonable than any which has hitherto appeared. The whole mechanism of dislocations of the hip, and of their reduction, is dependent on the condition of the anterior part of the articular capsule, which is, in this situation, thickened into a fibrous band commonly described as the ilio-femoral ligament.

"This ligament is more or less adherent to the acetabular prominence and to the neck of the femur; but it will be found, upon examination, to take its origin from the anterior-inferior spinous process of the ilium, passing downward to the front of the femur, to be inserted fan-shaped into nearly the whole of the oblique spiral line which connects the two trochanters in front—being about half an inch wide at its upper or iliac origin, and but little less than two inches and a half wide at its fan-like femoral insertion. Here it is bifurcated, having two principal fasciculi, one being inserted into the upper extremity of the anterior intertrochanteric line, and the other into the lower part of the same line, about half an inch in front of the small trochanter. The ligament thus resembles an inverted Y, which suggests a short and convenient name for it."

In the large majority of hip dislocations, both branches of this "Y ligament" remain intact; in a few the outer branch is broken, the inner

remaining; while in others, which are properly called Irregular Dislocations, both branches are broken. Dr. Bigelow justly, we think, rejects the name of dislocation "into the ischiatic notch," and gives to this, which is a mere variety of that on the dorsum ilii, the more accurate title of "dorsal dislocation below the tendon;" the tendon in question being that of the obturator internus muscle, behind or below which (with a part of the capsule), the head of the bone is in these cases confined. Dr. Bigelow gives the following classification of dislocations of the hip, which is anatomically correct; though for practical purposes, it seems to us, his first two and last three regular dislocations might be considered in either case as forming but one variety.

"I. The REGULAR DISLOCATIONS, in which one or both branches of the Y ligament remain unbroken.

1. Dorsal.
2. Dorsal below the tendon (*ischiatic notch of Cooper.*)
3. Thyroid and downward.
Obliquely inward on the thyroid foramen, or as far as the perineum.
Vertically downward.
Obliquely outward as far as the tuberosity.
4. Pubic and sub-spinous.
5. Anterior oblique.
6. Supra-spinous.
7. Everted dorsal.

Both branches entire.

} *External branch broken.*

II. The IRREGULAR DISLOCATIONS, in which the Y ligament is wholly ruptured, and whose characteristic signs are therefore uncertain."

We would gladly follow Dr. Bigelow in his able exposition of the exact mechanism of each of these varieties of dislocation, the manipulation required for reducing each of which becomes obvious, as soon as that mechanism is clearly understood. To do this satisfactorily would, however, require more space than our limits will allow, and, besides, a mere verbal description, without the assistance of the illustrative wood-cuts, could hardly convey a fair idea of Dr. Bigelow's reasoning. Suffice it to say that, in the dorsal dislocations, the outer branch of the Y ligament is the one principally concerned; while in all the rest, it is the condition of the inner branch that determines the surgeon's motions in effecting reduction. With regard to reduction, it is evident, from a consideration of the anatomical relations of the part concerned, that extension in the line of the axis of the trunk can only act by violence, stretching or tearing the Y ligament, and that hence the first step in all the processes of manipulation must be to *relax* the ligament by *flexing* the thigh on the pelvis. The leg is flexed on the thigh, simply as a matter of convenience and to gain leverage. Having relaxed the Y ligament, the dislocation may often be reduced by *jerking* the head of the bone into its socket, by direct *traction* in a direction vertically upwards (the patient's trunk being recumbent), by the *gentle shaking* recommended by Hippocrates (p. 28), or by the rotation and circumduction methods, which must be varied according to the nature of the particular luxation. In the backward dislocations, having relaxed the Y ligament by flexing the thigh on the pelvis, the limb being somewhat inverted (a movement which, in the dislocations behind the tendon, likewise dislodges the head of the bone from its abnormal seat), the surgeon employs abduction and rotation outwards (as directed by Drs. Nathan Smith and Reid), and thus fixes the great trochanter against the outer branch of the Y ligament, causing the latter to

roll around the neck of the bone, and thus to serve as a kind of sliding fulcrum by which to pry the head of the bone into its socket.

In the thyroid dislocation the proceeding is reversed—the *inner* branch of the Y ligament, with the obturator muscle, being made to wind around the neck of the femur by *adduction* and *inward* rotation. If in any case difficulty is met with from the smallness of the capsular orifice, it can readily be enlarged by abduction or circumduction outwards, in the case of the backward dislocations, or by adduction or circumduction inwards, in the case of those in a forward direction.

“To reduce the other varieties of downward luxation, the femur should be flexed and its head drawn and guided towards the socket, during which manœuvre these dislocations are sometimes converted into that upon the thyroid foramen, or upon the dorsum below the tendon.”

Reduction of the pubic dislocation by rotation “is to be accomplished by much the same method as in the thyroid dislocation, except that in the pubic luxation the flexed limb should be carried across the sound thigh at a higher point.”

The three remaining regular dislocations may be reduced by first converting them into the ordinary dorsal variety, and then proceeding as for an original dorsal luxation.

We have thus endeavoured to indicate as briefly as possible the *principle* upon which reduction by manipulation is to be effected; for the details of treatment and the modifications suited to each variety, we must refer the reader to Dr. Bigelow's pages. We will merely add that, in flexing the thigh so as to relax the Y ligament, if it be too much flexed, the relaxation will be excessive, and the ligament will not serve as a fulcrum on which to exercise the necessary leverage; while, if the capsular laceration be very large, if the limb be too much abducted, the dorsal may be converted into a thyroid dislocation, or *vice versâ*, in the attempt to rock the head of the bone into the acetabulum. This risk can be avoided by limiting the degree of abduction, and *lifting* the limb during the manipulation.

Under the heading of “Special Conditions of Dislocation,” Dr. Bigelow discusses, successively, old dislocations and their reduction, dislocation from hip-disease, dislocation of the hip with fracture of the shaft of the femur, and spontaneous dislocation. With regard to the treatment of old dislocations, Dr. Bigelow's experience confirms our own, that there is not so much difficulty in *effecting* as in *maintaining* reduction, on account of secondary changes in the head of the bone and the acetabulum. In such a case, Dr. Bigelow recommends that the limb should be fixed in the position in which reduction was effected, until the cotyloid cavity becomes again excavated by absorption. For effecting reduction in old dislocations, or in cases of dislocation complicated with fracture, an ingenious apparatus is described and figured, by which *angular extension* may be made.

“Although the need of this apparatus may be rare,” says Dr. Bigelow, “it will prove occasionally efficient in reducing a luxation of long standing or complicated with fracture. At any rate, I cannot believe that the period is remote when longitudinal extension by pulleys to reduce a recent hip luxation will be unheard of.”

Dr. Bigelow gives an account of three cases in which patients possessed the power of luxating and reducing the head of the thigh-bone by muscular action. In all of these the direction of the dislocation was dorsal. We have ourselves met with one case in which the patient possessed the power of spontaneously producing a thyroid dislocation. In this instance

the patient was a female and epileptic. She had been an inmate of both the Pennsylvania and the Philadelphia Hospitals, and was in the habit of dislocating her thigh in public places in order to excite sympathy.

The second portion of Dr. Bigelow's volume is devoted to Fractures of the Neck of the Femur, which the author proposes to divide simply into "1st. The impacted fracture of the neck into the trochanter; 2d. Other fractures of the neck." As he very justly remarks, the application of the terms *intra-capsular* and *extra-capsular* has not much practical value, as even after death it is often impossible to say whether a certain fracture has been within or without the capsular ligament; while during life the distinction is still more difficult, for the reason that the attachments of the capsule vary greatly in different subjects. Moreover, the treatment is precisely the same for both intra- and extra-capsular lesions. The signs of the impacted fracture are pain and tenderness, slight shortening (usually about half an inch), eversion, or rather, impossibility of inversion, with rotation of the trochanter in an arc around the head of the bone, and an absence of crepitus. To these we would add flattening of the trochanter, which, though very slight, can, we believe, be usually detected by careful inspection. The anatomical structure of the neck of the femur, which is well described by Dr. Bigelow, explains the occurrence of eversion and shortening as the almost necessary accompaniment of impaction; in some rare cases, however, where the comminution of the shaft is greater, there is positive inversion. The treatment of impacted fracture does not require extension, but in other respects is the same as that for unimpacted fracture of the same part.

The concluding pages are devoted to fractures of the pelvis. Dr. Bigelow justly remarks that the diagnosis of fractured acetabulum is unwarranted in cases where there is no crepitus. Mere inability to keep the head of the bone in place, after reduction of a dislocation, is more likely to be due to other causes, and can commonly be remedied by fixing the limb in the position of angular extension, or in that particular posture in which the reduction was finally accomplished.

A sufficiently full Index terminates Dr. Bigelow's handsome book, of the main features of which we have endeavoured to give our readers a condensed abstract. It is a very useful book, and, we believe, sound and thoroughly practical. We doubt not that it will add to its author's already high reputation as both a thinking and a working surgeon. There are one or two slight literary blemishes which should have been corrected by the proof-reader: thus, in the summary on page 27, which we have quoted, the sentence "The irregular dislocations . . . whose characteristic signs, etc.," is manifestly ungrammatical, and should read "the characteristic signs of which." Again, the word "perpendicular" is several times used, where "vertical" would explain more exactly what is meant. These things are indeed scarcely worth mentioning, and would not attract attention but for the great scientific excellence and general literary and artistic beauty of the book. The paper and press-work (executed at the Cambridge University Press) are all that could be desired, while the wood-cuts are really very finished productions.

J. A., JR.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXIII.—*Saint Bartholomew's Hospital Reports*. Edited by Dr. ANDREW and Mr. CALLENDER. Vol. V., 8vo. pp. xxiv., 287. London: Longmans, Green & Co., 1869.

On the principle of being twice indebted to the giver who is prompt in his benefactions, we ought to feel doubly obliged to the staff of St. Bartholomew's Hospital for the commendable and, we may add, customary punctuality with which their annual volume of reports is issued. The series has now completed its first *lustre*, and, we are glad to say, shows no indication of decrepitude or premature senescence, but appears as full of vigour and of future promise as at its beginning. The present volume (which we consider on the whole superior to its last year's predecessor) contains twenty scientific communications, and is adorned with six excellent lithographic plates. As has been lately our custom in dealing with the various hospital reports, we shall now proceed to notice its contents, grouping together those papers which seem of special *surgical* interest, and those again which more directly refer to practical *medicine*.

We shall first invite our readers' attention to Article I., "*The Anatomy of Brain Shocks—Part II.*," by GEORGE W. CALLENDER. The first portion of Mr. Callender's paper appeared in Volume III. of the Reports, and was noticed in the number of this Journal for July, 1868, p. 225. It contained 48 cases, to which are now added 51 more, making a total of 99. As lovers of medical statistics, we cannot help wishing that there was one more; it would have so much facilitated the calculation of percentages. The cases themselves are well told, but we cannot linger over them, and must be contented with pointing out a few of the more important deductions derived from their study. With regard to *apoplexy*, it appears that those cases which terminate suddenly or very quickly are almost invariably cases of *intra-ventricular* bleeding; extravasation on the surface or even into the substance of the brain is more slow in its action, and the sudden death which sometimes eventually occurs in these cases, after brain symptoms have existed for several hours or days, is really due to secondary ventricular involvement. This fact is justly compared with the well-known phenomena of death from cerebral abscess, which may exist for months or even years, producing great destruction of substance without any very marked symptoms, until finally bursting into the ventricles, this secondary condition brings about a rapidly fatal issue. Bleeding into the *pons* is rather quickly fatal; bleeding into the substance of either hemisphere on the *outer* side of the optic thalamus or corpus striatum causes death more rapidly than bleeding into other parts; and apoplexy of the *right* cerebral hemisphere is more rapidly fatal than when the left side is affected.

As to the condition of the pupils, "no very certain results are obtained, although it may be noticed that in certain cases an absolutely dilated and fixed pupil is connected with disease or injury about the course of the cerebral bloodvessels, whilst a contracted and fixed pupil is often met with when blood is poured out into, or when the disease is present in, the tissue of the brain."

So far as my observations of surgical injuries to the brain have gone, no reliance can be placed upon the condition of the pupils as symptomatic of brain hurts, except perhaps in their slow action, or in absence of their action, when light is allowed to fall upon the eyes." The dilatation and fixation of the pupils or their slow response to light, appears to coexist with cerebral compression: free mobility, rather with laceration. *Loss of sight* usually depends on involve-

ment of the optic nerves or tracks : in only one case was it connected with disease of the brain substance, and in this instance "the entire right optic thalamus and a large part of the middle of the right lobe of the cerebellum were reduced to a soft and red-coloured pulp."

"Pain was present when very various parts of the brain tissue were involved, but in every case, when present, it happened that the outer gray matter had been implicated."

With regard to *aphasia*, Mr. Callender remarks upon "the general agreement of these cases with the propositions—that with loss of speech (a) the anterior cerebral lobes, or the parts about the corpus striatum or the motor track, are diseased or injured; (b) that such disease or injury involves the left side; (c) that whilst the parts about the corpus striatum are found to be diseased, it is not evident that the disease or injury is limited in these cases to the third frontal convolution (so-called.)" A curious fact in connection with this subject was that the aphasic condition sometimes disappeared during the existence of delirium.

Convulsions seem to be particularly associated with disease about the track or distribution of great vessels, especially of the middle cerebral arteries, and with the shock of a hemorrhage, and are particularly connected with *left* hemiplegia, and with disease of the right hemisphere external to the optic thalamus and corpus striatum.

This, which is the concluding portion of Mr. Callender's paper, contains five illustrative diagrams, and fully justifies the expectations raised by the first part, the whole forming, as we expressed the belief that it would, "a most valuable contribution to our knowledge of the *anatomy of brain-shocks*."

The second article in the present volume is by WILLIAM S. SAVORY, F. R. S., and is called "*Notes, with Cases, on some of the immediate and remote Effects of Injuries to the Spinal Cord*." Mr. Savory seems not to be aware that anything has been either written or said concerning spinal injuries since the well-known paper by Sir Benjamin Brodie in the *Medico-Chirurgical Transactions* for 1836 (vol. xx.); hence his remarks will not, we fear, come to some of his readers with the same refreshing charm of novelty which they evidently possess for himself. Still his conclusions have been evidently worked out independently, from his own observations, and have the value therefore which independent confirmatory testimony always possesses. The cases which he narrates are moreover quite interesting in themselves, and, we need scarcely add, are well narrated and clearly analyzed and discussed. A curious fact noted in one case was that when reflex muscular contraction could no longer be evoked in the lower extremities by peripheral irritation, it could still be excited by the combined influence of such irritation with a voluntary effort. The whole paper occupies 28 pages, and a good many of these are devoted to "*spinal concussion*."

Upon this vexed subject, we cannot see that Mr. Savory has shed any new light: he very properly rejects the statements of the older writers as to the non-existence of spinal lesions in fatal cases of this kind, and says, "even assuming a case of the kind to occur where the minutest microscopic scrutiny by a most skilful observer failed to detect any change, still nothing, I believe, in what is yet understood of the relation of force to matter supports the conception that the function of a nerve centre can be thus struck out, the integrity of its structures being nevertheless unaffected;" and yet shortly afterwards, referring to cerebral concussion, he admits the possibility of "annihilation of function" unassociated "with any actual lesion in the ordinary acceptation of the term," and asks, "If the centres of consciousness may be thus paralyzed, why not the centres of respiration?" For our own part, we utterly disbelieve in any *concussion* of either brain or spinal cord, in which there is no physical lesion; there may indeed be a *mental* condition, or a *general physical condition* (*shock*), either of which or both of which may and often do coexist with injuries of the central nervous system, but neither of which is in any degree essentially connected with the condition habitually and conveniently designated as concussion. Those states of mind or of body may or may not be associated with physical lesion, but to decide that point would be foreign to the present question. But that either cerebral or spinal concussion can exist without lesion—temporary and

evanescent, perhaps, but still a lesion—we do not believe. This lesion need not be either extravasation or laceration; it may be congestion or determination, as evanescent as a blush, or it may be a more or less temporary arrest of cell-action; but to assume that because it is sometimes quickly recovered from, or cannot be definitely recognized after death, it does not exist, seems to us an assumption not only utterly unsupported by well observed facts, but quite at variance with what is actually known, and with all the tendencies of modern pathology.

Art. III., *On Residual Abscesses*, by JAMES PAGET, F.R.S., strikes us as both practical and interesting. "Under the name 'residual abscesses,'" says Mr. Paget, "I would include all abscesses formed in or about the residues of former inflammations. Most of them are formed where pus, produced long previously, has been wholly or in part retained and become dry, or in some form 'obsolete.' But some of them, it is probable, are formed in the thickenings, adhesions, or other lowly-organized products of inflammation long past." These residual abscesses are chiefly met with in connection with disease of the spine or of the various joints, with necrosis of the interior of the long bones, and with old inflammations of the lymphatic glands. They are to be treated as any other abscesses, except that, as their disappearance without discharge is very rare, their suppuration should rather be promoted than retarded. "Many of the cases I have related are instances of the very long time during which a part once damaged by inflammation may remain unsound; and the disappointment felt on the occurrence of a residual abscess may, to some, seem to cast discredit on the practice of permitting or aiding the absorption or drying-up of chronic abscesses connected with diseases of spine or joint. But the discredit is not just; for many patients in whom such abscesses have disappeared have never suffered after-consequences; and, so far as I have yet seen, the healing of discharged residual abscesses is quicker, and attended with much less disturbance than the healing of first abscesses of the same size and in similar situations."

Art. IV., *Two Cases of Complete Dislocation of the Knee forwards, with Rupture of the Popliteal Vessels, requiring Amputation*, by GEORGE LOWE. The subject of this paper is sufficiently expressed in its title. With the following conclusion of the writer we fully agree: "In every case of dislocation of the knee, in which the circulation through the large vessels is arrested, and is not restored on reduction being effected, and when, after reaction is fairly established, the temperature of the limb below the injury is less than the natural standard, and there is a swollen condition of the leg, with a dusky leaden hue, amputation should not be delayed." We would even go further, and say that in any case of dislocation of the knee, complicated with rupture of the popliteal vessels, removal of the limb should at once be practised as a primary measure. Had operative interference not been delayed in Mr. Lowe's cases until gangrene was imminent or (as in the first case) actually present, his patients might have got off with amputation immediately above the knee, instead of in the upper third of the thigh. The successful issue of these two cases should not be looked upon as establishing a precedent for delay, which must render the operation, when finally performed, of much graver prognosis than if it had been resorted to at an earlier period of the case.

Art. VI., by ALFRED COLEMAN, describes *A Convenient Apparatus for the Administration of Chloroform*. This apparatus essentially consists of a graduated glass bottle with a perforated stopper, through which the chloroform escapes drop by drop upon a sponge fixed in a metal tube, open at one end, and by the other communicating with a hollow sphere, which is fitted with two wire gauze diaphragms and an ordinary Snow's face-piece. The patient thus inhales air mixed with a proportion of chloroform never, according to Mr. Coleman, more than 3 to 3.5 per cent. We confess that this apparatus seems to us less adapted to insure safety than Mr. Clover's, while it is not a great deal less inconvenient. Perhaps, when chloroform has to be used at all, the method

usually adopted in this country, with a simple handkerchief, is as satisfactory as either.

Art. X., *A Case of Syphilitic Laryngitis, in which Tracheotomy was successfully performed*, by H. LLOYD WILLIAMS, presents no features of special novelty or interest. The form of tube used was that devised by Mr. Durham, which answered in this case a better purpose than the ordinary instrument.

Art. XI., *Rachitis*, by HOLMES COOTE, is a paper of considerable interest. After describing the three acts upon which the physiological growth of bone depends, Mr. Coote points out, following Volkmann, the disturbing influence which rickets exercises upon each: "The cell growth" [from the periosteum] "which precedes ossification goes on rapidly, while the deposit of earthy matter is insufficient, or ceases entirely. Irregular and often large spaces are formed in the medullary structure. The epiphyseal cartilage becomes swollen and enlarged, and forms those peculiar elevations which have induced people to speak of 'double joints' in connection with this disease. Swellings are also seen in the ribs at their junction with the cartilage." A peculiarity of rickety bones is seen in "the extension of the medullary spaces beyond the line of ossification into the cartilage itself, so that irregular outgrowths of red colour are seen protruding into the blue cartilage." With regard to the treatment of rickets, Mr. Coote lays great stress upon the importance of change of air, especially recommending a seaside residence, and of suitable food and clothing. He objects to the use of tonics, including cod-liver oil, during the acute stages of the disease; thus radically differing from his colleague Dr. Gee, who, it will be remembered, in the last volume of the *Reports*, spoke of cod-liver oil as "a pharmaceutical agent worthy of a place beside iron, Peruvian bark, and mercury," and declared that no time should be wasted over symptoms, but the oil administered from the first, and continuously. Mr. Coote advises the use of movable couches, and, with some restrictions, that of splints or other supporting apparatus. Where the deformity persists in after life he has seen advantage from the sub-periosteal removal of a wedge-shaped piece of bone.

Art. XII., *Lithotomy Cases from Private Practice in the Bala Lake District*, by OWEN RICHARDS, M. D., Aberd. Dr. Richards narrates ten cases, in nine of which the ordinary lateral operation was performed, the tenth being in a woman; three of his patients died, though only one from the results of the operation, the others dying, one from phthisis, and one from bronchitis. The ages of Dr. Richards's patients ranged from 46 to 68 years, and he mentions the curious fact, that during twenty-four years' continuous residence in Bala he has never once been consulted by a person under twenty suffering from symptoms of stone. Dr. Richards prefers to hold the staff in his own left hand while incising the prostate, instead of following the ordinary plan, which intrusts the whole management of the staff to an assistant.

Art. XIII., *Nævoid Elephantiasis*, by THOMAS SMITH, is one of the most interesting papers in the whole volume. This very curious affection, which has been named and described by Prof. Fayrer, seems to consist in the ordinary form of elephantiasis, or Barbadoes leg, *plus* a nævoid condition of the skin and subjacent tissues. Mr. Smith has seen two such cases, the best marked of which forms the text of the present paper. It occurred in a child of nine months, having existed at the time of birth, when it greatly impeded delivery; but since the age of seven months had very much increased. The whole of the right¹ lower limb and buttock were hypertrophied, the leg and foot being in a condition undistinguishable from that seen in elephantiasis Arabum, while the thigh, though proportionately less enlarged and softer, was extensively stained on its outer side, with a dusky red cutaneous nævus. The limb was sensibly warmer than its fellow, from three to four times its circumference, and three inches longer, the lengthening being due to hypertrophy of the integuments over the heel and plantar surface. The swelling diminished somewhat under firm bandaging, but

¹ Incorrectly given in the text as the *left* limb: the plates and subsequent descriptions show that the *right* was the limb affected.

the child soon after died without any very obvious cause. A very good description of the affected part, which was removed and carefully dissected, is added, and illustrated with three excellent lithographic plates. Mr. Smith refers to several cases lately published of *elephantiasis* accompanied with *lymphorrhœa*. Our readers will find such a case, reported by Dr. J. C. Morris, in the Transactions of the Philadelphia College of Physicians, in the number of this Journal for April, 1869, p. 392, and may refer with interest, in connection with the subject of elephantiasis in general, to a discussion and elaborate report by Drs. W. Pepper and Andrews in the Proceedings of the Pathological Society, in our number for October of the same year, pp. 424-428.

"It is thus not unlikely," adds Mr. Smith, "that under the term *Elephantiasis Arabum*, three diseases, quite distinct in their origin, though identical in their results, have been often included, namely, what we may term lymphatic elephantiasis, vascular or nævoid elephantiasis, and the ordinary elephantiasis Arabum of climatic origin. These diseases, though arising from different causes, have this in common, that as a consequence, the elements of nutrition (whether contained in blood, chyle, or lymph) are in excess in the part affected, and that as a natural result the overfed tissues become overgrown, the overgrowth being specially manifest in those tissues that are more lowly organized, and are perhaps less discriminative in the materials they select for their nutrition."

The question of tying the common iliac artery had been discussed before the death of the patient, and Mr. Smith therefore, as an experiment, tried to apply a ligature upon the corpse, but found so free a flow of blood from the spongy venous tissue in the lumbar region, as to render it very doubtful whether the operation would have been practicable during life.

Art. XIV., *Protoxide of Nitrogen as an Anæsthetic*, by ALFRED COLEMAN. Mr. Coleman evidently believes that the coming man will use nitrous oxide more freely than the present one; after some reflections (which we cannot but think uncalled for) upon those who have written against this anæsthetic agent, Mr. Coleman proceeds to describe the improvements which have recently been introduced in the mode of its preparation and administration. The first of these is the facility now offered for procuring the gas in a condensed form—fifteen gallons being compressed into five pints; the second, the adaptation of a lime box so that the gas can be purified from carbonic acid and thus breathed over and over again; and the third, certain modifications in the apparatus itself, proposed by Mr. Clover. Mr. Coleman thinks the protoxide of nitrogen as now used the safest agent where prolonged anæsthesia is not required, and believes that if it should at any time produce unfortunate results, it will be from rupture of diseased vessels in the brain. Mr. Coleman believes that nitrous oxide gas is not decomposed in either the lungs or the blood, and in support of this position gives several analyses of the expired gas.

Art. XVIII., *Intra-Ocular Growths in Children*, by BOWATER J. VERNON, is of pathological as well as surgical interest. The older writers habitually described these growths as of a cancerous nature, but "cancer," says Mr. Vernon, "in the modern acceptance of the phrase, is almost unknown as occurring within the eyeball."

"The tumours which appear in the retina may be said to be of two kinds, or at least appear as two varieties of one kind, according as they are soft or firm in texture, consisting simply of small cells of uniform size and shape, or approaching the sarcomatous tumours in the variety of their cell formation, and the greater or less amount of the fibrous stroma which they contain. Virchow has called these tumours gliomas and gliosarcomas, and considers them as analogous to certain cerebral tumours which he describes as taking their origin in the neuroglia or delicate connective tissue which exists throughout all large nerve-centres and nerve-trunks." These tumours occur in very young children, sometimes even in foetal life, are more frequent in males than in females, occasionally appear simultaneously in both eyes, and may occur in several members of the same family. They make their appearance in the outer layers of the retina, and as they grow cause increased ocular tension, this being to some ex-

tent a diagnostic sign, as retinal detachment from effusion is almost always accompanied by diminished tension. When the disease spreads backwards along the track of the optic nerve, death is sometimes very rapid from extension of the morbid condition within the head. The only treatment to be recommended consists in complete and early extirpation, though even that will not always prevent the further spread of the disease.

Art. XX., and the last in the volume, gives a *Comparison of the Death Rates after Amputations in Country Private Practice, in Hospital Practice, and on Country Patients in a Town Hospital*, by GEORGE W. CALLENDER. This is an elaborate and we think valuable statistical contribution upon the much vexed question of "*Hospitalism*," which is just now violently agitating our professional brethren in England and Scotland. Mr. Callender attempts to, and, we think, fully succeeds in showing the unfairness and utter worthlessness of the statistics upon this point, published by Sir James Y. Simpson in the *Edinburgh Medical Journal*, an exposition which does not at all surprise us, as we have ourselves had occasion to comment upon the learned Baronet's loose way of using figures in the matter of the Acupressure Controversy (see No. of this Journal for July, 1867, p. 235). Still Mr. Callender's own statistics are not entirely satisfactory, though probably as much so as any that are likely to be obtained: thus, with regard to the *country* patients treated in *town* hospitals, Mr. Callender says that many of them were "sent up from the country on account of the remarkable severity or obscurity of their ailments," to which of course his antagonists might reply, that it is more probable on the contrary that they were selected cases, as such only could bear the expense and fatigue of transportation to the metropolis. The inference which Mr. Callender draws from his investigations we believe to be a very true one, viz., that the results of amputations depend more upon the condition of the patients than upon the place where the operations are done; still we cannot help thinking that his opponents have a germ of truth on their side also, and that large hospitals though indispensable even for the treatment of surgical cases, are yet susceptible of improvement in hygienic conditions.

The usual reports of the registrars are not included in this volume, an omission which we join the editors in thinking a matter of regret; it is proposed, however, in the next volume to publish notices of the hospital practice on a different plan. We do not know whether our regularly recurring annual complaints have had any effect in bringing it about, but we are glad to be able to say that the present volume contains not only an index to its own contents, but likewise indexes, separately paged, for each of the preceding volumes. These indexes are not so full as we could wish, but, such as they are, are of very considerable value.

J. A., JR.

We shall now proceed to notice the articles treating on subjects of practical medicine. The first of these, the initial paper in the volume, is a short obituary notice of Dr. EDWARDS, one of the physicians of the hospital, and favourably known as the author of the series of *Statistical Reports*, which, under his direction as Medical Registrar, were published from year to year, and which gave evidence of the industry with which he discharged a methodical and somewhat monotonous duty.

Art. V. *Contributions to the Pathology of Chorea*, by HENRY M. TUCKWELL, M.D., Oxon. Dr. T., who is a supporter of Dr. Kirkes' views in regard to the frequent dependence of chorea upon embolism of the cerebral arteries, finds them entirely confirmed by the history and results of the autopsy of the case of fatal chorea, which he reports.

The following extracts are taken from notes made at the autopsy: "The brain was well developed and presented nothing abnormal in its coverings or surface. The upper half of each cerebral hemisphere was carefully sliced down to a level with the corpus callosum, and the lateral ventricles were opened without any trace of softening being detected in either the gray or white matter of this part. The corpus callosum and fornix were firm and healthy. No excess of fluid in the lateral ventricles. The brain was now turned over, and the cerebral

arteries were carefully followed up by dissection to their smaller branches, without any evidence of obstruction in any part of their course. But on tracing out the posterior cerebral artery, and thereby displacing the middle cerebral lobe, it became manifest that the under part of this lobe on the right side was in a state of softening. This softening was not excessive, but easily recognizable; it had not, apparently, affected the very surface of the convolutions, but involved the deeper layers of the cortex, and more especially the subjacent white substance, extending upwards into the neighbourhood of the corpus striatum and optic thalamus, which ganglia lay, as it were, imbedded in a nest of softened cerebral matter. The softened tissue was redder than the surrounding healthy white substance, this red tinge being especially pronounced in the deepest layer of the cortex. The corpus striatum was, seemingly, not itself affected. The optic thalamus was encroached on at its under and outer aspect by the disease, but was in the main firm and apparently natural. . . .

A microscopical examination of the fresh brain-tissue showed that in those parts, which to the naked eye appeared soft, many of the small bloodvessels were dotted along their walls with minute granules scattered and in clusters. In the firm, healthy looking brain-tissue no such appearance could be detected.

. . . . The mitral valve, looked at from its ventricular aspect, seemed perfectly competent, and presented no unusual appearance; but examined from its auricular aspect, by opening out the left auricle, it was altered as follows: A line of numerous, bright, clustering, warty vegetations, some as large as a pin's head, others so minute as to be only just visible to the naked eye, and that in a certain light, but shining like little white beads when slightly magnified, extended in a sinuous course all along the free margin of each cusp. In two or three places these little growths appeared to have been shed off, for they hung only by a fine pedicle to the line of attachment, and clung close to the chordæ tendineæ."

Embolic patches were, moreover, found in the kidneys.

The condition of the heart above described also existed in the case reported by the author in the *British and Foreign Medico-Chirurgical Review* for October, 1867, and he believes that it is one of the most frequent lesions in this disease. Dr. Hughlings-Jackson and Dr. Broadbent have both adopted the theory of the embolic origin of chorea, and have located the exact seat of the disease; the former in the nerve tissue forming the convolutions near the corpus striatum; the latter in the sensori-motor ganglia themselves, and both hold that the chorea arises from the irritability or disordered nutrition of these parts, which results from the shutting off of their due supply of blood, and as a similar condition of the cerebral hemispheres will produce delirium, so chorea may be regarded as a delirium of the sensori-motor ganglia. If the disturbance of nutrition be carried still further, it results in paralysis, and it will be remembered that paralysis frequently alternates with choreic convulsions. Dr. Broadbent, while he insists upon embolism as the usual cause, says, that as the sensori-motor ganglia are the seat of the disease, anything which produces disturbance in their nutrition will give rise to it, and it may therefore occasionally depend upon peripheral irritation, producing disordered nutrition of this part of the brain.

Dr. Tuckwell, in corroboration of his opinion that the condition of the valves found in the case which he reports, is a frequent one in chorea, refers to a paper by Dr. Ogle, an analysis of which will be found in another part of this number, and which contains the histories of sixteen fatal cases, in ten of which fibrinous concretions were found on the valves, and in eight of these ten on their auricular surface. Dr. Broadbent meets Dr. Ogle's objection that in cases of "acknowledged capillary embolism, chorea has not been present, but rather the symptoms and post-mortem appearances of pyæmia and gangrene," with the reply that the condition of the heart which gives rise to the symptoms of pyæmia, is not that found in the choreic heart. "In the former we see a process of disintegration and breaking down of the valves going on, so that the degenerate débris, which passes into the circulation, acts evidently on the blood like the putrid fluids from a surgical wound, and death follows rapidly from pyæmia. In these cases are found, here and there—it may be in one organ only, as the kidney or spleen—emboli of various sizes, while the general appearance of the

internal organs is just that which is met with in blood-poisoning. But how different is the choreic heart. Here there is no process of disintegration in the valves, but a collection of fresh vegetations which can do no more than act mechanically or as irritants."

Dr. Barnes is another opponent of the embolic origin of chorea, and asks the question: "Do you make a distinction between fatal and non-fatal cases? If you don't, you must allow that embolism is a very frequent and benign affection, which in the great majority of instances recovers." This Dr. Tuckwell answers by saying that many of the cases which get well may be of reflex origin, and that he sees nothing improbable in the recovery of cases from embolism, inasmuch as cases of hemiplegia from embolism may and do recover. Dr. Tuckwell also holds that rheumatism is generally the cause of the condition of the valves which gives rise to chorea, and that this is especially true of children, and says that the reason that the pre-existence of rheumatism is not more clearly made out, is simply that, in many cases, rheumatism occurring in children presents certain anomalies which prevent its recognition. Thus there is in young persons an absence of great pain in or swelling of the joint, and of the profuse sweating which characterizes the disease in adults. Choreia, moreover, occurs most frequently in those who are most exposed to the causes of rheumatism, namely, the poor, while it is comparatively rare among those who are in comfortable circumstances.

The above is an analysis of this very able and instructive paper, and we place it as we did Dr. Ogle's without comment before our readers, merely remarking that in our experience, the condition of the heart which most frequently gives rise to embolism, is not that which at the same time produces pyæmia. A coloured plate accompanies this paper.

Art. VII. *Cirrhotic Enlargement of the Liver*, by SAMUEL J. GEE, M. D. The patient in this case, a man of intemperate habits, presented evidences of an enlarged liver, which extended from the crest of the ilium to the fourth rib. The lower edge of the organ was felt with difficulty, as the man was unusually fat, but irregularities could be distinguished on its surface. The great increase of size excluded the diagnosis of a fatty liver, the general condition of the patient, the idea of cancer; and against lardaceous disease, there was the depth of the jaundice, the irregularities of the surface of the organ, and the absence of lardaceous disease elsewhere. Every other diagnosis but enlargement from progressive increase in the connective tissue of the organ, not going on to contraction, seemed to be excluded. At the autopsy the liver was found to weigh 100½ ounces, not to be very dense, somewhat flabby, and having an uneven surface. The lobules were separated by a whitish, more translucent tissue than the normal tissue of the liver, everywhere distinct and abundant; no doubt connective tissue between the lobules. It is not stated positively whether the microscope confirmed the diagnosis or not; the fact being only mentioned that under the microscope the hepatic lobules consisted of very fatty epithelium and fatty molecular detritus. The weight of the organ, 100½ ounces, is small when we take into consideration the fact that it was said to have occupied a very large part of the abdominal cavity.

Appended is a short account of a similar case, in which the liver weighed 104 ounces. Dr. Gee does not think that had the livers of these patients been prolonged, their livers would ever have undergone such a degree of contraction as is usual in cirrhosis in the ordinary acceptance of the term.

Art. VIII. *The Hospital Midwifery Statistics*. From January 1, 1862, to December 31, 1868, prepared by CLEMENT GODSON. The tables contained in this paper are of interest. The following is an analysis of them: Of 5734 deliveries there were 49 cases of twins; 1 in 117.02, or 0.855 per cent. Of the 5783 children born, 3065 were males, that is 53 per cent.; 2718 were females, that is 47 per cent., so that the excess of males over females was 6 per cent.; 5502, or 95.95 per cent., were head presentations; 13, or 0.24 per cent., were face presentations; 64, or 1.12 per cent., were breech presentations; 35, or 0.61 per cent., were presentations of some part of the lower extremities; 5504, or 95.17 per cent., were born living. Twenty-one women, or 0.37 per cent., died either

within a month of delivery or from the effects of labour. The forceps were employed 128 times. Craniotomy was performed four times, and in every instance the mother recovered.

Art. IX. *Acute Pemphigus*, by SAMUEL J. GEE, M. D., London. This is the report of a case of the so-called acute pemphigus, the existence of which is alternately denied and affirmed by authorities of equal respectability in dermatology. The patient was a girl, 4 years of age, who, up to the time of the appearance of a rash resembling measles, had been quite well. Three days later all the red spots were covered with watery blebs. Seven days after this she was admitted into Dr. West's ward at the hospital. The thermometer, being placed in the axilla, indicated a temperature of 103° F. The temperature continued high through the greater part of the attack. The following is the description of the eruption, from Dr. Gee's notes, taken at the time of her admission: "The blebs are perfectly similar to those caused by cantharides, the first appearance is very much like measles, but less port-wine coloured, rather brighter red; papulæ feel rather rougher than those of measles. The large patches are made up of aggregated papulæ. Upon these papulæ appear minute vesicles, so that the redness at first is in great excess of the vesication, the appearance is not unlike a patch of herpes; each vesicle enlarges until it is of the size of the papula; *the blebs are made up of the confluence of numerous vesicles upon the same patch.*" The disease seems to have run its course in about seven weeks.

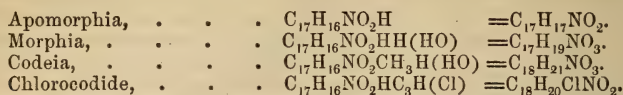
As Dr. Gee himself intimates, this will not universally be regarded as a case of acute pemphigus, and the formation of blebs from the confluence of several vesicles, as stated in that part of the description we have italicized, is nowhere mentioned as the usual manner of appearance of the eruption in pemphigus.

Art. XV. *Contribution to Cerebral Pathology*, by W. S. CHURCH, M. D. Oxon. The cases recorded in this paper are a continuation of those published in the preceding volume of the Hospital Reports. In the histories and results of the autopsies of the first five cases, Dr. Church finds a confirmation of the opinion he expressed last year, that there was no good reason for separating the form of disease characterized by the presence of small granulations on serous membranes, and similar granulations in the lungs from tuberculosis. The disease termed "*la granulie*," by Prof. Empis, is not distinct from and coincident with tuberculosis, but is one of the many forms of deviations from the normal condition met with in the tissues of tuberculous subjects. The cases may be classed under the following heads: Tubercular meningitis, 5; infantile convulsions, 2; congestion of the brain, 1; atrophy and induration of brain, 3; acute meningitis, 2; softening of the spinal cord, 2; softening of brain, 2; Embolism, 2; apoplexy, 5; aneurism of cerebral arteries, 2; tumour of the brain, 1; carcinoma of dura mater, 1. One of the cases of intracranial aneurism is especially interesting from the fact that the age of the subject, 13 years, is the youngest yet recorded in this disease.

A table of 12 cases of intracranial aneurism, occurring in persons 20 years of age or under, accompanies this paper. All the cases except the one above alluded to have been previously tabulated, and the table by no means contains all the reported cases of aneurism of the cerebral arteries which have occurred at these ages. In six of the twelve cases there is good reason to believe that the aneurisms were due to emboli plugging the arteries, and thus causing a sudden stress upon the walls of the vessels, behind the seat of obstruction, which might occasion rupture of one of its coats, or the presence of the occluding clot might lead to changes in the nutrition of the arterial wall, which would be followed by subsequent yielding before the blood stream.

Art. XVI. *Note upon Apomorphia and Chlorocodide*, by SAMUEL J. GEE, M. D., Lond. Apomorphia is a new base obtained by Dr. Matthiessen, and is possessed of very powerful emetic properties, in doses of $\frac{1}{4}$ grain, by the mouth, and $\frac{1}{16}$ grain subcutaneously. It, moreover, acts very speedily, but unfortunately in many instances depresses the patient, not, however, by causing gastro-intestinal irritation or inflammation. The high price of the article

makes it unlikely that it will be ever much used as a remedy. Apomorphia is derived from codeia, and in the process an intermediate body, chlorocodide, is formed. The relationship between these bodies will be understood from their formulæ :—



Experiments with chlorocodide show that it is possessed of properties resembling those of codeia. Thus a watery solution was injected subcutaneously into a cat. Salivation and dilatation of the pupils was produced in less than ten minutes. A somewhat larger dose produced extreme restlessness, and when nine and a half grains had been injected, the animal passed rapidly into a tetanic condition, which lasted for about three-quarters of an hour, when death supervened from convulsions. The only property of chlorocodide which holds out any promise of usefulness in medicine is its extreme bitterness. A quarter of a grain taken by the mouth, causes an uncommon sense of tonicity in the abdomen, and does not produce the same fullness and aching of the head as quinia, which does not possess nearly the same degree of bitterness.

Art. XVII. *Observations upon the Action of Ipecacuanha and its Alkaloid Emetia*, by DYCE DUCKWORTH, M. D., Edin. Dr. D. was induced to prosecute some inquiries as to the properties of emetia, in consequence of the difficulty frequently experienced in procuring the action of emetics in young children, when administered by the mouth. The alkaloid has been little used by physiologists or therapeutists, and is an amorphous substance, devoid of odour, and having the colour of scammony powder, and a bitter taste, which most resembles that of opium or gentian. It is almost insoluble in cold water, but is soluble in hot water, and freely so in alcohol and the acids. Four to six ounces may be obtained from 100 pounds of the ordinary root. The test is the tincture of nutgalls, which throws down a dense precipitate from a solution of this substance; a tannate of the alkaloid, according to Pereira, being formed. The tincture of nutgalls is also an antidote to emetia, and will prevent its action if administered at the same time, and may be used to detect its presence in the urine of animals poisoned by it. Some of the results of Dr. Duckworth's experiments are at variance with those of Dr. Pécholier, for he tells us that the respirations became more frequent, and the cardiac action not less frequent than in health. In his experiments there was always found more or less engorgement of the lungs, and in some cases even lobular pneumonia, and more or less congestion of the gastro-intestinal tract, and chilliness of the surface. From these and other circumstances the experimenter was induced to believe that ipecac. has some special action upon the vagus, and that is probably of the nature of an exhausting stimulus. And this view is corroborated by the fact that similar conditions are produced by the section of the nerve. No noteworthy changes in the brain have been observed. In most of the cases of poisoning from this substance the urine contained albumen.

Art. XIX. *What becomes of the Medical Students*, by JAMES PAGET, F. R. S. Mr. Abernethy is said to have exclaimed on one occasion on entering his lecture-room and seeing it crowded with students, "God help you all! What will become of you?" The present communication is an answer to this question, by Mr. Paget, who tells us what became of a thousand of his pupils, within fifteen years of their entrance at St. Bartholomew's Hospital. Of the thousand 23 achieved distinguished success, 66 achieved considerable success, 507 achieved fair success, 124 achieved very limited success, 56 failed entirely, 96 left the profession, 87 died within 12 years of commencing practice, 41 died during pupilage. Among those who are considered to have achieved distinguished success are the present Professors of Anatomy at Oxford, Cambridge, and Edinburgh. Ninety-six, or nearly 10 per cent. of the whole number left the profession after beginning either its study or its practice. To place against this, there were only seven who came to the profession from other

pursuits of life, and of these five again changed their mind and never engaged in practice. Of the whole number nearly 13 per cent. were dead within fifteen years. This proportion, we are told, agrees so nearly with the general average mortality, that it gives no reason for considering the medical profession either less or more healthy than other pursuits, at least in its earlier stages, for according to the English Life Table, No. 3, out of any 1000 males, who have attained the age of 19 years, 131 will die within 15 years.

In conclusion, Mr. Paget says: "In remembering those with whom I was year after year associated, and whom it was my duty to study, nothing appears more certain than that the personal character, the very nature, the will, of each student had far greater force in determining his career than any helps or hindrances whatever. All my recollections would lead me to tell that every student may draw from his daily life a very likely forecast of his life in practice, for it will depend upon himself a hundred-fold more than on circumstances. The time and the place, the work to be done, and its responsibilities, will change; but the man will be the same, except in so far as he may change himself."

J. H. H.

ART. XXIV.—*A Text-Book of Practical Medicine with Particular Reference to Physiology and Pathological Anatomy.* By Dr. FELIX VON NIEMEYER, Professor of Pathology and Therapeutics, Director of the Medical Clinic of the University of Tübingen. Translated from the Seventh German Edition by special permission of the Author, by GEORGE H. HUMPHREYS, M.D., etc. etc., and CHARLES E. HACKLEY, M.D., etc. etc. Vol. I., pp. xv.-731. Vol. II., pp. viii.-770. New York: D. Appleton & Co., 1869.

So many excellent text-books on the Practice of Medicine are at present within the reach of the American medical student, that the task which the translators of Dr. Niemeyer's work have imposed upon themselves may seem to many an unnecessary one. A more intimate acquaintance with the book will convince most physicians that this conclusion is a hasty one, and we agree with the opinion expressed in the preface to the American edition that its perusal will be attended with pleasure and profit. Familiar, as we have been for some time with an earlier edition, we were ourselves fully prepared to give the translation a favourable reception, and from its general excellence we are disposed to think that it will soon take its place among recognized text-books. We do not mean by this that the works of Dr. Wood, Dr. Watson, or Dr. Aitken are in any danger of being superseded, for all of these have so many points of excellence, that a long time must elapse before they will cease to be valued either by the student or his teacher, but we think that it is probable that it will take equal rank with them.

One advantage which these volumes have, is that they render us familiar with German methods of practice. Although a knowledge of the pathology of Rokitanzky, Virchow, and others is tolerably freely diffused throughout the medical community of this country, there are many, even among those of us who read the language, to whom the therapeutics of the Germans are entirely unknown, and a work of this kind will therefore be welcome, presenting, as the translator's preface tells us it does, "a concise and well-digested epitome of the results of ten years of carefully recorded clinical observation by the most illustrious medical authorities of Europe, together with many valuable and practical deductions regarding the causes of disease and the application of remedies, such as we believe have not yet been assembled in any single work."

Unlike the different works on Practice mentioned above, this one contains no introductory remarks on the subjects of general pathology, etiology of disease, general therapeutics and diagnosis, but we are at once introduced to the subject of special pathology—the first chapter being devoted to hyperæmia or catarrh of the larynx. The former arrangement has the advantage of preventing a good deal of repetition, but, on the other hand, there are many students

who prefer to have each disease fully and separately discussed, and for purposes of reference the plan of Dr. Niemeyer's book is certainly a convenient one.

Our author, while he evidently does not inculcate a blind reliance upon drugs or methods of treatment which have the sanction of age, and but little else to recommend them, nevertheless is a firm believer in his art, and does not teach the distrust of all remedial measures, so common at the present day, which must in the end tend to destroy the confidence it is so necessary the patient should place in his physician. Some of the remedies recommended differ from those in common use here, and many of the familiar articles of the *materia medica* are used in diseases in which we rarely or never employ them, but in every instance the special indication is distinctly pointed out. Dr. Niemeyer, moreover, believes that the effects of medicines upon the lower animals or upon man in health are not always to be relied upon as furnishing indications for their administration in disease, but, on the contrary, holds that the science of therapeutics can only approach perfection when the action of medicines in disease is carefully studied and noted.

A review of Dr. Niemeyer's book is scarcely called for at the present time; we shall therefore content ourselves with pointing out its general plan, and some of the author's peculiar views in regard to therapeutics or pathology, which we think will be of interest to our readers. The first part of the first volume is devoted to diseases of the respiratory organs; the second, to diseases of the circulatory organs; the third, to diseases of the organs of digestion; the fourth, to diseases of the liver and bile ducts; and the last, to diseases of the spleen. In the second volume the following subjects are treated: 1, diseases of the urinary organs; 2, diseases of the sexual organs, both male and female; 3, diseases of the nervous system; 4, diseases of the skin; 5, diseases of the organs of locomotion, under which head are included rheumatism and gout; 6, constitutional diseases.

Some of the views in regard to inflammation of the air passages differ from those generally held. According to Dr. Niemeyer, there are three varieties of pneumonia.

1. "Croupous pneumonia, in which the air cells are involved in a process identical with that which attacks the mucous membrane of the larynx in laryngeal croup."

2. "Catarrhal pneumonia, a process intimately related to that already described as catarrhal bronchitis and laryngitis, producing an augmented secretion, and active generation of young cells (*pus corpuscles*), but in which no *coagulable* exudation is formed. In both these varieties of inflammation the inflammatory products are thrown out upon a free surface, the tissue of the lung itself suffering no essential disturbance of nutrition."

3. "Interstitial pneumonia, which is an inflammation involving the walls of the air vesicles and the interlobular connective tissue. As in the human subject, this latter form is always a chronic disease; it has been also called *chronic pneumonia*, in contradiction (*sic*) to the other varieties, whose course is usually acute."

It is the second variety which Dr. Niemeyer believes to be, in the great majority of cases, the exciting cause of phthisis, since its products have a great tendency to undergo the so-called caseous degeneration. The author's views of the relation which pneumonia bears to phthisis were noticed by the present writer in the October number of this Journal for 1868, and it is therefore not necessary to refer to them more fully, except to say that the author's views, if literally understood, would place phthisis among the purely local diseases. The several forms of inflammation indicated above appear to be capable of affecting any of the organs, undergoing only those modifications which difference of tissue renders necessary; thus we have a catarrhal, a croupous, and an interstitial or diphtheritic inflammation of the larynx; and so, to a certain extent, of the liver.

Our author believes that the coma of apoplexy is not due to the pressure of the clot, but to anæmia of the brain, and in order that his views may be thoroughly comprehended, we will quote his own words. "It is usually supposed that the apoplectic fit is a result of the pressure or bruising of the nerve

filaments and ganglion cells of the entire brain by the extravasation. However, it is evident that this pressure can never exceed that of the blood in the cerebral arteries; for, as soon as the pressure in the parts around the arteries is as great as that of the blood in the vessels, no more blood can escape from the latter. But, from experiments that we can make on peripheral nerves, there is no doubt that such a pressure is entirely insufficient to annul the excitability of the nerve filaments. The following fact also tends to disprove the current explanation: if the symptoms of paralysis depended upon the pressure to which the filaments of the brain are subjected in apoplexy, bleeding should remove these symptoms not only in some, but in all cases, provided enough blood be drawn to lessen the pressure in the whole vascular system, particularly in the arteries. . . . We refer the apoplectic fit to sudden compression of the capillaries, that is, anæmia of the brain. In all large hemorrhages this anæmia may not only be recognized with certainty after death, but even during life it shows itself by a very important symptom, which is usually falsely interpreted, that is, by a remarkable pulsation of the carotids. This symptom is very generally regarded as a sign of 'increased pressure of blood to the head,' although it really indicates that the flow of blood into the skull is obstructed; we may at any moment induce the same phenomenon in the artery of the finger by tying a string tightly around the end of the finger."

As the subject of venesection in the treatment of acute inflammation is at the present time exciting much attention, the tendency being towards the almost entire abandonment of a remedy which was formerly regarded as the sheet anchor of the physician in his contest with disease, it will be interesting to learn what conditions are regarded by Dr. Niemeyer as indications for its employment. It will be seen by the extract which we give below, that bleeding is not recommended simply because the patient is the subject of an inflammatory or febrile disease, for he holds that it has not the power of shortening these diseases, but simply with the view of preventing or modifying certain complications which place the life of the patient in danger. As our author expresses his opinions on this point more fully, while speaking of the treatment of pneumonia, than in any other connection, we quote his indications for venesection:—

1. "When the pneumonia has attacked a vigorous and hitherto healthy subject, is of recent occurrence, the temperature being higher than 105° F., and the frequency of the pulse rating at more than one hundred and twenty beats a minute. Here danger threatens from the violence of the fever; and free venesection will reduce the temperature, and lessen the frequency of the pulse. In those who are already debilitated and anæmic, bleeding increases the danger of exhaustion. Should the fever be moderate, bloodletting is not indicated, even in healthy and vigorous individuals. It cannot cut the fever short, and indeed the fever is more apt to persist, although in a somewhat more moderate degree, so that the enfeebled patient is thrown into greater danger than if he had had to pass through a more violent fever, but with unreduced strength."

2. "When collateral cedema in the portions of the lung unaffected by pneumonia is causing danger to life, the pressure of the blood is reduced by bleeding; and, by prevention of further transudation of serum into the vesicles, insufficiency of the lung and carbonic acid poisoning are averted. Whenever the great frequency of respiration in the commencement of a pneumonia cannot be traced to fever, pain, and to the extent of the pneumonic process alone, as soon as a serous, foamy expectoration appears, together with a respiration of forty or fifty breaths a minute, and when the rattle in the chest does not cease for a while after the patient has coughed, we ought at once to practise a copious venesection, in order to reduce the mass of blood, and to moderate the collateral pressure."

3. "The third indication for bleeding arises upon the appearance of symptoms of pressure upon the brain, not headache and delirium, but a state of stupor or transient paralysis."

In pneumonia, as well as other internal inflammations, Dr. Niemeyer thinks highly of the external use of cold water. In pneumonia, he recommends that cloths dipped in cold water and wrung out, should be applied to the affected side of the patient's chest every ten minutes. This treatment, unusual as it

is, and troublesome as it must be to the nurse, does not seem to meet with the opposition which might be expected; on the contrary, it brings about speedily so great a reduction in the frequency of the pulse, in the temperature of the skin, and in the severity of the pain, that the patient and his friends are said eagerly to demand it.

Great prominence is given to the alkaline-muriatic mineral waters in the treatment of chronic catarrh of the air passages; the indications for their use are, however, not very clearly given, and the author acknowledges that it is not always easy to distinguish those cases, upon the course of which they have a decided influence from those in which they have no effect. Nor is it possible to say upon what this influence depends, although there is no scarcity of hypotheses to explain it. According to one theory, these mineral waters supply the salts that are lost to the system by the excretion of mucus, which, as is well known, contains certain salts in greater quantity than the blood, but this would hardly explain the resolution of the catarrhal process which frequently takes place under their use. Virchow found that very dilute solutions of the alkaline carbonates were capable of exciting the ciliary movement in epithelium, and from this fact the inference is drawn that their use tends to re-establish the extinguished or repressed ciliary motion. Our own country abounds in medicinal springs of great value, but, so far as we know, their waters are but little used in the treatment of cases of chronic bronchial or laryngeal inflammation.

We cannot close this short notice without bearing testimony to the excellence of the translation. Knowing by experience that it is not always easy to avoid the idioms of a foreign language, and at the same time to convey the meaning of the author, it gives us pleasure to confirm an opinion, which we have seen elsewhere expressed, that were it not for the title page, there would be little to call attention to the fact that this book is the work of a German. There are a few mistakes, and some of these are typographical; they are, however, very unimportant, and do not detract from the general excellence of the work. In all respects the book is issued in a manner which reflects credit upon the publishers.

J. H. H.

ART. XXV.—Recent works on Stricture of the Urethra.

1. *De l'Uréthrotomie Externe dans les Rétrécissements Uréthraux Graves ou Compliqués.* Par le Dr. EUG. BOECKEL, Professeur Agrégé à la Faculté de Médecine de Strasbourg. 8vo. pp. 36. Strasbourg, 1868.
On External Urethrotomy in Severe or Complicated Urethral Strictures. By Dr. EUG. BOECKEL, etc.
2. *On External Perineal Urethrotomy, or an Improved Method of External Division of the Urethra in Perinæo, for the Relief of Obstinate Stricture, with Remarks on the Preparatory and After-Treatment.* By J. W. S. GOULEY, M. D., Professor of Clinical Surgery and of Genito-Urinary Diseases in the University of New York, etc. etc. 8vo. pp. 32. New York, 1869.
3. *On the Immediate Treatment of Stricture of the Urethra, by the employment of the "stricture dilator."* By BERNARD HOLT, F. R. C. S., etc. etc. Third Edition. 8vo. pp. xii., 136. London: John Churchill & Sons, 1868.
4. *Clinical Lectures on Diseases of the Urinary Organs.* By Sir HENRY THOMPSON. (Lectures II. and III.) 12mo. pp. 204. Philadelphia: Henry C. Lea, 1869.

WE have placed together the titles of the four works named above, in order to bring to the attention of our readers the modes of treatment for urethral stricture which are principally in vogue at the present day, and to show what are the statistical results, as reported, of the various methods. To begin with the last work on our list, which was noticed in the number of this Journal for April, 1869, we will say that we think that Sir Henry Thompson best expresses the general opinion of the profession, when he declares that for strictures which admit the passage of an instrument, simple dilatation should be the ordinary

remedy, and other methods but exceptionally resorted to. There are, however, as long ago pointed out by Mr. Bryant of Guy's Hospital, a certain number of cases which readily admit a catheter, and yet which cannot be cured by dilatation, either from the stricture being contractile or resilient, or from the idiosyncrasy of the patient causing an intolerance of catheterization, shown by the occurrence of a combination of constitutional symptoms which now commonly receives the name of urethral fever. (See *Guy's Hospital Reports*, 3d S., vol. iv. p. 80.) For such cases the surgeon may choose between three plans of treatment, viz: internal urethrotomy from before backwards (as practised by Civiale and Thompson), external urethrotomy with a guide (as practised by Syme), or the *immediate treatment* of Mr. Holt, which he formerly practised by rapid dilatation, but for which he has now substituted *splitting* of the stricture.

Mr. Holt's method has been extremely, not to say marvellously successful in his own hands: no less than 670 strictures has he split, with only two deaths, one from renal disease, and one from pyæmia following an abscess at the neck of the bladder. Had other surgeons succeeded equally well, we might lay down our pen, believing that the perfection of stricture treatment had at last been obtained; but unfortunately the operation has done less well in the hands of others, and therefore, while acknowledging the claims of Mr. Holt's method to the favourable attention of surgeons, we cannot consider that its pre-eminence over other plans is yet established.

The operation of external urethrotomy with a guide is applicable to strictures behind the scrotum, and that of internal urethrotomy for those in the anterior part of the urethra. Syme's operation has been very successful in his own hands, that distinguished surgeon having cut seventy or eighty patients before he met with a single fatal case. Sir Henry Thompson collected, in the second edition of his work on Stricture, 219 cases of this operation, which gave but fifteen deaths, while twelve cases by French and German operators, collected by Dr. Boeckel, give two deaths, neither, however, strictly attributable to the operation, one being from pyæmia, and one from hemorrhage following hospital gangrene.

For strictures which will not admit the passage of an instrument (and we believe the existence of such strictures is now acknowledged by every one, except Sir Henry Thompson), the principal modes of treatment are internal urethrotomy from before backwards, and external urethrotomy or perineal section. It is as furnishing means of justly appreciating the latter operation that the pamphlets of Dr. Boeckel and of Dr. Gouley are, it seems to us, of special value.

There are four conditions in which Dr. Boeckel considers external urethrotomy to be indicated: these are: 1. Cases of impassable stricture complicated with retention of urine; 2. Cases of impassable stricture uncomplicated with retention; 3. Strictures which, though passable, are complicated with fistulæ or with the existence of foreign bodies, etc., in the bladder; and 4. Cases of traumatic rupture of the urethra, with retention of urine. For the first two classes of cases, Dr. Boeckel recommends the ordinary operation with which we are familiar in this country as perineal section, and which consists in cutting down upon the point of a staff previously introduced and held against the stricture, then working gradually backwards in the median line, with cautious strokes of the scalpel, till the posterior part of the urethra can be detected, and finally introducing upon a director or *urethral gorgere*, a vulcanized India-rubber catheter which is allowed to remain for a variable period, generally about three weeks; this operation, it will be perceived, differs from Cock's (*Guy's Hospital Reports*, 3d S., vol. xii. p. 273), in that the latter aims to open the urethra *behind* the stricture, which it does not divide, being in fact, as its author terms it, "tapping the urethra at the apex of the prostate, unassisted by a guide-staff." For Dr. Boeckel's third class of cases he recommends Syme's operation or a modification of it; it is a much simpler proceeding than the operation without a guide, and also, we may add, more successful in its results: in cases complicated with the presence of a foreign body in the bladder, it can readily be changed into an operation of median lithotomy. With regard to cases of traumatic rupture of the

urethra, Dr. Boeckel justly observes that if a catheter can be promptly introduced, nothing further will be required; but if this be impracticable, immediate external urethrotomy, which he calls a "new practice," offers the best chance; in reference to this point we would invite our readers to refer to vol. xix. of the first series of this Journal (No. for February, 1837, page 392), where they will find a full discussion of this matter by the editor of the Journal, with an interesting collection of cases, a perusal of which, we think, will induce them to look upon Dr. Boeckel's proposition as, though unquestionably sound, not quite so new as he supposes it.

Dr. Gouley's pamphlet, which is a reprint from the *New York Medical Journal* for August, 1869, appears to be a kind of *avant-courier* of a more elaborate production which is promised in the future. Dr. Gouley introduces a capillary probe-pointed whalebone bougie through the stricture, and upon this as a guide passes a "No. 8 grooved metallic catheter, with a quarter of an inch of its extremity bridged over so as to convert the groove into a canal, the bridged portion itself being also grooved. To insure the incision retaining the median line, Dr. Gouley adopts Mr. Avery's plan of passing a loop of silk through each edge of the incised urethra, close to the face of the stricture, these loops being held by assistants, and serving as landmarks by which the surgeon may orient himself (to quote an expression of Dr. Boeckel's) at each step of the operation. The stricture is divided on the whalebone guide with a small knife modified from that of Weber for slitting the canaliculus. Finally the grooved catheter is carried over the guide into the bladder, and the flow of urine shows that the operation is completed. If difficulty is experienced in introducing the guide, from the existence of a false passage, Dr. Gouley directs that one guide after another shall be inserted till the false passage is filled up, when at last one will enter the stricture. It is better (as recommended by Sir Henry Thompson) to fill the urethra with oil, before introducing the guide, than to rely merely upon the application of oil to the latter. Dr. Gouley further recommends that after the operation no instrument should be left in the bladder, but that the surgeon should content himself with passing on the second day, and afterwards every third day "a full-sized, highly-polished, conical steel sound."

Dr. Gouley gives in a table the details of twenty-five cases in his own practice, which resulted as follows:—

Perineal section without guide,	.	.	11 cases, no deaths,
do. with capillary guide,	.	.	10 " 3 "
Syme's operation,	.	.	4 " 1 "
Total,	25	"	4 "

or a total mortality of 16 per cent.

Dr. Gouley adds that he has a record of 345 operations by American surgeons (233 being without a guide) with but 41 deaths, a mortality of about 12 per cent.—so small a figure that we cannot resist a suspicion that some of his informants have forgotten to mention their fatal cases.

Dr. Boeckel's tables, from French and German sources, give a total of 75 operations with 16 deaths ($21\frac{1}{3}$ per cent.). Of these, 35 are known to have been without guide, and gave 8 deaths (nearly 23 per cent.), and 12 are known to have been done with a guide, giving 2 deaths, or $16\frac{2}{3}$ per cent.

We have read both Dr. Boeckel's and Dr. Gouley's pamphlets with much interest, and consider them particularly well timed just now, as advocating the more frequent employment of an operation which we believe to be a very good one, but which has of late years been rather out of favour with the majority of surgeons. Of course, the operation with a guide is preferable where it can be practised, and Dr. Gouley's ingenious plan of securing an entrance through the orifice of the stricture is certainly worthy of a trial; with regard to the benefits to be derived from retaining or not retaining a catheter after the operation, further experience is, we think, needed; we have ourselves always kept an instrument in the bladder for some days after the operation, not with a view of preventing the contact of urine with the wound, for this cannot be helped; but because we have found the introduction of the instrument during the

inflammatory stage of the operation wound, both troublesome and painful; still the testimony brought forward by Dr. Gouley to the advantages of his plan, is so strong, that we shall be much tempted to follow his advice in the next case that may come under our care.

J. A., Jr.

ART. XXVI.—*De la Résection Coxo-femorale pour Carie.* Thèse pour le Doctorat en Médecine, par RICHARD GOOD, Docteur en Médecine, etc. 4to. pp. 112. Paris, 1869.

On Excision of the Hip-joint for Caries. By RICHARD GOOD, M. D., etc.

THIS essay or thesis, which is really one of much interest, is divided into six chapters, to which are added an appendix of cases and a bibliographical list of previous monographs or other writings on the subject. We purpose to give our readers a short analysis of Dr. Good's work, and then to give a summary of the statistics which he has collected, together with those which we ourselves have published in the second volume of the *Pennsylvania Hospital Reports*.

After some preliminary remarks, in which Dr. Good says that his researches are meant as supplementary to the labours of M. Le Fort, whose memoir on hip-joint excision was read to the Academy of Medicine in 1860, and published the following year, our author gives in his first chapter a very good historical account of the introduction of this operation into surgical practice, particularly in reference to the difficulties which its advocates have had to contend with in France. The chapter terminates with a carefully prepared table of 112 cases which have occurred since 1860, and which the author has collected from a variety of different sources. In comparing the statistical results deduced from a study of this table with those furnished by other writers, it is to be observed that all the cases classed by Dr. Good as recoveries, are such as have got entirely well, without even a single fistulous opening remaining. Hence the proportion of cures is smaller in Dr. Good's tables than in those which admit as recoveries cases in which superficial openings still exist. The 112 cases of the table are all terminated; besides these, the author has collected 21 others, of which 5 recovered with fistulæ, 7 were still under treatment, and 9 are simply said to be "not cured." Dr. Good's second chapter gives an analysis of his table, and from it we quote the following particulars: Of the whole number (112 cases), 52, or $46\frac{1}{2}$ per cent., recovered, and 60, or $53\frac{1}{2}$ per cent., died. Difference of sex appears to exercise little or no influence on the result of the operation, there being but a fractional percentage in favour of males. The mortality of the operation in different countries is as follows: France, 86 per cent.; Russia, 67 per cent.; Germany, 65 per cent.; America, 45 per cent.; and England, 34 per cent. The average age in the successful cases was $11\frac{1}{2}$ years, the youngest patient being a boy of 2, and the oldest a woman of 58. The average age in the fatal cases was 14, the youngest patient being 3, and the oldest 40.

The mortality according to age was as follows: From 2 to 12 years, 41 per cent.; from 12 to 20 years, 60 per cent.; over 20 years, 76 per cent. Of the 60 fatal cases, 10 died in the first week, and 26 in the first month. The chief causes of death were exhaustion (22), phthisis, etc. (10), pyæmia (5), pelvic caries, etc. (4), and diarrhœa (3).

In 29 cases the supposed cause of the disease was noted: in 20 it was attributed to a fall, in 4 to the effects of cold, in 1 to a wound, and in only 4 to constitutional predisposition. The average duration of the disease before operation was twenty-seven months. Nine cases in which the disease was acute, having lasted less than seven months, gave 7 deaths (78 per cent.), while 30 chronic cases (more than two years' duration) gave but 10 deaths (33 per cent.). The

¹ Dr. Good's percentages are all carried out to two figures of decimals, but in quoting them we have usually taken the nearest unit, above or below.

head of the femur had undergone spontaneous luxation in 17 cases, of which only 6 died (35 per cent.), while there was no luxation in 93 cases, which give 52 deaths (56 per cent.). Cases where the acetabulum was healthy gave a mortality of 50 per cent., and cases where it was diseased a mortality of 54 per cent. As far as this point was noted, Dr. Good's tables show a more favourable result where the acetabulum is gouged than where it is left alone. The mortality where the great trochanter was left was 61 per cent.; where it was removed, only 48 per cent. In 42 of the 52 recoveries the preserved limb is known to have been more or less useful; in 19 cases the patient could walk alone, and in 9 with the aid of a single cane. The movements of the new joint were restored in 28 cases, while ankylosis occurred only once.

The percentage of mortality given by Dr. Good is higher than that given by any other writer, and the reason for this is, he says, because his tables include the French cases which have been very fatal, and because some of his cases have been traced for many years to a fatal termination, when in other tables they would have been merely classed as undecided. To estimate the comparative advantages of excision over expectant treatment, Dr. Good refers to the thesis of M. Gibert, published in 1859, which gave an account of twelve cases of hip-disease with suppuration, treated without operation, of which but one recovered, while eight died. Hence Dr. Good places the mortality under expectant treatment at 89 per cent., as compared with a death rate of 52 or 53 per cent. for excision. He concludes the chapter in the following words: "Suppurative coxalgia is a serious malady, which usually ends in death. Resection does not give a very favourable result, but it saves life 46 times in 100, and, moreover, leaves the patient a limb much more useful than could be done by any other treatment."

Chapter III. is called "Indications and Contraindications." Among the circumstances favourable to the success of the operation may be mentioned the absence of organic disease or morbid diathesis, whether inherited or acquired; the limitation of the disease to the head of the femur, when this can be ascertained; the existence of spontaneous luxation; and a chronic course of the disease. The most favourable age for the operation is from three to twelve years, and the proper moment for intervention when an articular abscess has opened externally and has left persistent fistulæ. The chief contraindications are the existence of phthisis or scrofula, great exhaustion of the patient, adult age, or great extent of osseous lesion; if a large portion of the femur be affected, Dr. Good advises amputation in preference to excision. Pelvic abscess is not necessarily a contraindication, and may be evacuated through the acetabulum, as practised by Hancock and Barwell.

Chapter IV. treats of the various operative procedures, of which Dr. Good considers the best to be the simple linear incision behind the trochanter, and Chapter V. is devoted to the after-treatment. For this Dr. Good recommends an apparatus devised by Mr. Barwell, but which differs from the one which is figured in that surgeon's work on *Diseases of the Joints*, in being hinged so as to allow abduction of the limb, and in making counter-extension from the axilla, and not from the groin. Dr. Good lays much stress upon the advice of Heyfelder that passive motion should not be begun for six or eight weeks after the excision, and reprobates the practice of other surgeons who begin such movements as early as the eighth day.

Chapter VI. treats of the results of the operation as regards the limb. Dr. Good's tables give but one instance of ankylosis, which he agrees with most writers in considering as less desirable than ligamentous union. Under the heading of "Utility of the Limb," Dr. Good gives a description, with two figures, of Dr. Sayre's operation for ankylosis of the hip-joint, an operation which our author considers to be in no degree an imitation or modification of Dr. Barton's. The shortening of the limb, in the cases collected by Dr. Good, was noted in thirty-five instances, the least amount being half an inch, and the greatest four inches. The observations of Flourens, Humphrey, and others are referred to, as showing that the growth of the femur is principally from its lower epiphyseal cartilage, and that excision of the hip is therefore less apt to be followed by shortening than excision of the knee.

Finally, comparing our author's statistics with those published by ourselves, we find 66 cases included in both tables; with regard to some of these, however, Dr. Good's researches furnish additional information. We have therefore to add to the 242 cases which we ourselves collected, 46 from Dr. Good's table, together with 10 out of 21 which he has collected but not tabulated, the remaining 11 being already included in our own tables. Four of these 10 were recoveries, though with fistulæ, while the results of the other 6 cases were undetermined. We have then a total of 298 cases, in 246 of which the results are known. The total number of recoveries (including those with fistulæ) is 130, and the total number of deaths 116, being a mortality of 47.15 per cent. of terminated cases, or of 38.93 per cent. of all cases submitted to operation. The death-rate for different ages, and the comparative results of partial and total excision, will appear from the following tables:—

Age.	Reco- vered.	Died.	Result undeter- mined.	Total.	MORTALITY PER CENT.	
					Of terminated cases.	Of whole num- ber of cases.
Under 5 years . . .	9	7	1	17	43.75	41.18
Between 5 and 10 years	51	23	15	89	31.08	25.84
“ 10 “ 15 “	39	25	16	80	39.06	31.25
“ 15 “ 20 “	11	15	1	27	57.69	55.56
“ 20 “ 30 “	10	17	3	30	62.96	56.67
Over 30 years . . .	2	11	1	14	84.61	78.57
Age not stated . . .	8	18	15	41	69.23	43.90
Total	130	116	52	298	47.15	38.93

Form of excision.	Reco- vered.	Died.	Result undeter- mined.	Total.	MORTALITY PER CENT.	
					Of terminated cases.	Of whole num- ber of cases.
Total excision . . .	58	44	12	114	43.14	38.60
Partial “ . . .	20	17	...	37	45.95	45.95
Form not stated . . .	52	55	40	147	51.40	37.41
Total	130	116	52	298	47.15	38.93

It is thus seen that the mortality of hip-joint excision is least between the ages of 5 and 10 years, and after 15 years rises very rapidly, so that in adult life the operation becomes one of very great risk, probably quite as much so as hip-joint amputation, of which the death-rate is estimated at 58.56 per cent. for all cases occurring in civil practice and at all ages. The second table shows that total are rather more successful than partial excisions, and if those cases where this point is not indicated be considered as partial excisions, the difference will still be maintained; the mortality percentages being then 43.14 against 50 for terminated cases, and 38.60 against 39.13 for all cases submitted to operation; an unanswerable argument, it seems to us, in favour of freely gouging the acetabulum whenever it is found diseased.

In taking leave of Dr. Good's essay, we would recommend it to the attention of those of our readers who are interested in surgical statistics, as a valuable contribution to the literature of its subject. With this volume and Dr. Otis's splendid *Circular No. 2*, which we reviewed in the last number of this Journal, we may fairly suppose that, for the present, to borrow a Gallicism, the "last word" has been spoken on excision of the hip-joint.

J. A., JR.

ART. XXVII.—*Miscellaneous Contributions to the Study of Pathology.* By JOHN W. OGLE, M. D., Physician and Lecturer on Pathology, St. George's Hospital, London. 8vo. pp. 72.

THIS interesting paper, originally published in the *British and Foreign Medico-Chirurgical Review* for January and April, 1868, contains the history of nineteen cases of fatal chorea, sixteen of which were treated in the wards of St. George's Hospital, and also some facts in regard to eighty non-fatal cases, all of which, with only two exceptions, occurred in Dr. Ogle's out-patient practice at the hospital, and which, for the sake of convenience, are arranged in a tabular form. There is, in addition, reference more or less full to many other cases, so that the material which the author had for the preparation of his paper is exceedingly abundant, a fact which renders his conclusions very valuable and reliable. Chorea is, moreover, so seldom fatal that we have reason to congratulate ourselves that it has fallen to the lot of so competent an observer as Dr. Ogle to make and record the results of the autopsies of so large a number of cases.

The following are the lesions which were noticed in Dr. Ogle's own cases: Congestion more or less complete of the nervous centres (brain, spinal cord, or both) in six cases; softening of the brain in one; and of the spinal cord in one; other diseases of the spinal cord in one; congestion and other graver lesions of the genital system in five cases; congestion of the peritoneum in one; fecal accumulation in two; fibrinous deposit or granulations upon some portions of the valves of the heart or its lining membrane in ten, and in two of these, in addition, pericarditis. This condition of the valves was unexpected, as in the histories of only three of these cases is the fact noted, that cardiac murmurs were heard during life. On the other hand, in one of the cases in which no lesion of the valves was detected at the autopsy, there is a record of a distinct double valvular bruit having been heard at one time and then having subsequently disappeared. In two cases the disease occurred in pregnant women.

Sex and age exercise an undoubted influence upon the course of the disease, for of the nineteen fatal cases, no fewer than sixteen occurred in women, and the greater number in patients whose age exceeded that at which chorea is most common.

In Dr. Ogle's sixteen cases, the disease was said to have lasted seven months in one case; six or seven months in one; three months in two; six weeks in two; nine weeks in one; three weeks in two; two weeks in one; ten days in three, and only eight days in one. In three cases there had been a previous attack; in eight fright, or mental emotion of some kind, was supposed to have been the exciting cause; rheumatism was said to have preceded the disease in six cases; and in four others, its pre-existence was inferred from the condition of the valves of the heart. In the three fatal cases (one male and two females), detailed at the end of the book, congestion of the nervous centres was also observed. In one, the spinal cord was soft and pulpy throughout its whole extent. It was sent to Mr. Lockhart Clarke for examination, who made the following report: "The spinal cord was slit through longitudinally; only the lower part of the lumbar enlargement remained entire, and this was not sufficiently hardened to admit of making thin sections. The lower portion of the dorsal region which had been slit through was evidently softened; small fragments examined under the microscope exhibited, however, chiefly an admixture of granules, with some compound granular corpuscles, without any remarkable alteration in the condition of the nerve fibres. This condition resulted, no doubt, from an early stage of softening in which a granular fluid exudation was poured out. Just below the middle of the lumbar enlargement the tissue was perfectly pulpy—of the consistence of cream, and a small portion of this picked out and placed on a slide, with as little disturbance as possible, showed under the microscope scarcely anything but broken nerve fibres mixed with granules and some compound granular corpuscles. Almost every fibre had assumed the form of the well-known globular or oval

masses of myalin or white substance, of different sizes, so that under a low power the arrangement resembled the cellular structure in a section of wood or stem of plant. In the lower part of the lumbar enlargement that had not been slit the gray substance was evidently in a state of disintegration." Pregnancy existed in both the female patients, and it was thought had had much to do with the production of the disease.

From the table containing the eighty non-fatal cases, we learn that sixty-one of the patients were females; that all but fourteen were under the age of sixteen; that the age at which the greatest number of cases occurred was eleven years, and that in only two cases was the age over twenty-one. The right side was affected in twenty-four, the left in twenty, and both sides in twenty-five. In the remaining cases, it is not mentioned whether one side was more affected than the other. In thirty-five cases, no cause for the attack was assigned or suspected by the friends of the patient, and in only five does fright or mental emotion appear to have been the sole exciting cause; but in nine other cases, in conjunction with ascarides, falls, or a quarrel, they are said to have produced the attack. In eight cases chorea affected those who had previously had rheumatic fever; but in only one case with such a history were the cardiac sounds interfered with. In two other cases, in which no rheumatic tendency could be detected, there was a systolic bruit at the base of the heart, and in one at the apex. In five cases it is stated that the catamenia had been scanty and irregular, or over-abundant and too persistent; and in one the attack followed a miscarriage. In three cases, the disease appears to have been hereditary. In twenty-five cases there was a history of a previous attack, and in five of these of two, and in one of several attacks (in only nineteen is it positively stated that there had been no previous attack). The disease had lasted in one case for four years, in one for eighteen years, and in another for six years. In only two is mental derangement spoken of; in eleven, paralysis of some kind was present; in two cases anæsthesia; in two atrophy of the muscles. The pupils were dilated in several cases, irregularly so in five—the right pupil being more dilated than the left in all of them. Pain in the head is spoken of in five cases, spinal tenderness in one, and disordered vision in three. In five cases the irregular movements were said to continue during sleep, and in one they were always worse when the patient was first aroused.

In nine of the cases not tabulated, some curious symptoms are noted. In one the movements are described as "coming on in paroxysms, principally affecting the muscles of the neck, and twisting his head so far around sometimes as to cause him to tumble down, screaming and barking." In another, great hypertrophy of the muscles of the back of the neck was caused by their constant action; and in another, there was constant rotation of the head; and in still another, in which there was a complication of hysteria, the patient rotated around her own axis. In two cases peculiar sounds were uttered, and in one there was loss of speech.

Among the most interesting of the questions discussed, is the relation which rheumatism and fibrinous deposits on the valves of the heart bear to the production of chorea. It is well known that Dr. Kirkes, some time ago, announced his belief that the irregular movements of this disease were due either to obstruction of the cerebral capillaries, or to irritation of the brain itself, in consequence of the circulation through it of an altered blood. This theory has been sustained and, to a certain extent, elaborated by Drs. Tuckwell and Hughlings-Jackson, and is supported by the frequent coincidence of deposits upon the valves of the heart, and local cerebral softening. But Dr. Ogle is unwilling to give it his unqualified approval, and some of the objections which he urges against its universal adoption are certainly forcible. In the first place not even the most ardent of its supporters would deny that there are many cases which cannot originate in this way, and we are, therefore, obliged to arrange cases of chorea in two classes; the first comprising those which depend upon embolism: the second, those which do not—which, as a cardiac murmur is by no means always heard, even in those cases in which after death fibrinous granulations on the valves are found, and as the majority of the symptoms in the two classes present great similarity, if not complete identity, is not an easy task. If embo-

lism, moreover, were a frequent cause of chorea, its manifestations would probably not be so frequently one-sided, or confined to certain groups of muscles. Again, the theory rests, up to the present time, almost upon pure speculation; for, so far as the writer is aware, there are few published observations of embolism of the cerebral vessels in which chorea-like symptoms occurred, in proportion to the number of times that emboli, or the softening induced by them, have been detected in the brain at *post-mortem* examinations. The symptoms, moreover, of this disease, certainly differ from those which are experimentally produced by the introduction into the circulation of minutely divided fibrin.

The sudden occurrence of the disease as a consequence of fright or other mental emotion, and its equally sudden disappearance, its relief by certain remedies, which cannot have the power of dislodging an embolus or preventing its usual effects, and the cessation of the irregular movements during sleep are all regarded as arguments against the acceptance of a purely mechanical theory of its origin. In regard to the deposition of fibrin upon the valves of the heart, Dr. Ogle says that it is probably due to the same condition that produces the chorea, and is not to be looked upon either as the cause or effect of the latter. He, moreover, thinks that rheumatism can scarcely be considered one of the predisposing causes of chorea.

For some of the reasons given above, Dr. Ogle also rejects Dr. Day's theory, that there is "some want of due relation between the bones and the inclosed part of the nervous system, the cavity not corresponding to the increasing marrow, and then a constriction or pressure may for a time produce an irritating effect.

J. H. H.

ART. XXVIII.—*On a Case of Death from Hemorrhage into the Pericardium, as a Result of Rupture of one of three true and circumscribed Aneurisms of the Coronary Artery of the Heart; with Observations on Aneurism or Aneurismal Dilatation as a Result of Embolism or Thrombosis.* By JOHN W. OGLE, M. D. 8vo. pp. 22.

THIS paper originally appeared in the second volume of the *St. George's Hospital Reports*, and was very cursorily noticed in the January number of this Journal for 1868, page 195. The patient whose case is reported was a man, aged 26 years, who had had rheumatism twelve years before coming under Dr. Ogle's care, and had latterly suffered from symptoms which indicated embolism of some of the branches of the right brachial artery as well as of some of the other arteries of the body. Six days before admission he had severe pain in the right arm, lasting about an hour. When the pain had left him, he found that he was unable to move his arm and hand. At the time of his admission there was still inability to extend the wrist, together with some numbness in the parts supplied by the ulnar nerve, a patch of ecchymosis on the inner side of the right arm just above the elbow, and much hardness and tenseness of the muscles of the inner side of this arm, extending up into the axilla. The action of the heart was tumultuous, and it was thought by some who auscultated it that in addition to a slight systolic murmur there was an exocardial bruit. The patient died the next day, apparently from syncope. The following is a summary of the results of the post-mortem examination: Slight atheromatous disease of the large arteries at the base of the brain; plugging of the smaller veins on the surface of the posterior lobes of the cerebrum and cerebellum with partially decolorized blood clots; distension of the pericardium by finely coagulated blood; thickening of, and fibrinous deposit in, the aortic valves; aneurismal dilatation of three different branches of the coronary arteries; a large mass of recently extravasated blood in the right kidney, in which was found a cavity which contained blood and was probably an aneurismal dilatation of a branch of the renal artery; and also in the muscular structure of the right arm, corresponding to the patch of ecchymosis, a large mass of extravasated blood which was believed to have proceeded from the rupture of an aneurism of one

of the muscular branches of the brachial artery; other dilatations were found in the neighbourhood, one of which was in close proximity to the median nerve.

The aneurism which had ruptured and given rise to hemorrhage into the pericardial sac was found perforated by a small opening, so that the loss of blood at first was probably a mere oozing, and this view is confirmed by the existence of an exocardial sound before death, which was no doubt caused by the presence of a small amount of blood in the pericardium. It is worthy of remark that in one of the cases referred to in this paper, and originally reported by Dr. Peacock to the *Pathological Society of London* (vol. i. p. 227 of the *Transactions*), a "peculiar flapping sound accompanying the action of the heart, but distinct from the ordinary cardiac sounds, was loudly audible along the course of the sternum and towards the left side," was heard the day before death; but previously no auscultatory phenomenon could be detected. In many of the other cases collected by Dr. Ogle there was nothing to attract attention to the heart until immediately before death, so that a diagnosis of this lesion must at present be impossible. Of the nine cases of which some details are given in this pamphlet rupture of the sac and hemorrhage into the pericardium took place in seven, and this may therefore be regarded as the usual termination, especially as it was also found to have taken place in three cases reported in the number of the *New York Journal of Medicine* for May, 1860, p. 384.

Dr. Ogle sees in this case confirmation of the view which he has long held and sustained, that the formation of aneurisms, especially of the smaller arteries of the body, is very often the result of embolism or thrombosis of the vessel. This valuable pamphlet terminates with a reference to five cases of rupture and dilatation of the cardiac veins, which the author believes to be even rarer than similar disease of the coronary arteries.

J. H. H.

ART. XXIX.—*A Practical Manual of the Diseases of Children, with a Formulary.* By EDWARD ELLIS, M. D., Physician to the Victoria Hospital for Sick Children; late Physician to the Samaritan Hospital for Women and Children. 8vo. pp. xiv. 275. London: John Churchill and Sons, 1869.

THIS little book is an appropriate companion to the several large works upon Diseases of Children which have been published during the past year. It contains nothing of clinical record, nor does it enter into the discussion of questions in pathology. Even in regard to treatment it shuns the consideration of methods, and uses such terms as cholagogues and counter-irritants according to their current value, because "the profession attaches to these terms qualities which are true qualities, though old theories of their action may be incorrect." We find no allusion to *progressive myo-sclerotic paralysis* nor to *fatty atrophic paralysis*, but all the more frequent diseases of infancy and childhood are properly noticed in convenient groups. The descriptions are concise and faithful, with sufficient detail to aid efficiently in cases of doubtful diagnosis. The first chapter, upon general management during the first year of life, and diet for children one year old and upwards, will be found useful for ready reference; and the last section contains general therapeutic hints and a copious formulary prepared with especial care. To those who avail themselves of this really excellent "Manual" we extend only one caution—that they do not follow too closely the author's frequent recommendations of antimony in various forms. And whatever view may be taken of the pathological relation of diphtheria to croup, we cannot indorse a therapeutic separation which would employ sustaining remedies in the former, and strongly antiphlogistic ones in the latter affection. The treatment in general advised by Dr. Ellis is good.

E. R.

ART. XXX.—*The Jurisprudence of Medicine in its Relations to the Law of Contracts, Torts, and Evidence, with a Supplement on the Liabilities of Vendors of Drugs.* By JOHN ORDONAU, LL.B., M.D. 8vo. pp. 310. Philadelphia: T. and J. W. Johnson & Co., 1869.

THE author of this book possesses the unusual advantage, as a writer on Medical Jurisprudence, of having had both a medical and a legal education, and thus is peculiarly fitted for a task requiring more knowledge of law than of medicine. His purpose is to exhibit the rights and duties of physicians and apothecaries, under the law, in some of their relations to the public. He thus supplies a want hitherto completely neglected, for we are not aware of there being any similar work in the literature of our profession. Such a book ought to be highly appreciated by medical men, for it teaches them directly what they can and what they cannot do, in certain relations. They are put in possession of information stored away in innumerable law books, utterly inaccessible to all but regularly bred lawyers. Here, within the compass of a few pages, they may learn their exact status before the law, the pecuniary obligations created by their professional service, their liabilities for malpractice, the nature of skilled testimony, their rights and duties on the witness-stand, the extent of obligations incurred by the rules of associations, and many other incidental matters. The vendors of drugs, and the manufacturing and dispensing pharmacutists, may also learn their liabilities for dishonesty or imperfection in their respective callings. The book is, essentially, a *résumé* of judicial decisions, the merits of which the author has not always undertaken to discuss. With what degree of fulness and accuracy he has executed his task, it belongs only to a lawyer to say. It struck us, however, that he has been too sparing of original remark, even on points where, without such help, it would be utterly impossible for the reader to learn, amid a host of dissimilar decisions, what really is and what is not the law. Decisions are strung together with so little regard to logical connection, that they must necessarily leave a confused impression on the mind. For instance, the account of the manner in which the expert's opinion is to be elicited, will convey no definite idea to one not previously acquainted with the subject. "In order," he says, "to make the opinions of experts admissible, they must be founded on a given state of facts, which should embrace all the facts relied upon to establish the theory claimed. Wherever these facts are controverted, they cannot be properly considered as affording the witness any opportunity of forming a conclusive opinion; for, as in the case of any other syllogism, if the premises are not admitted the conclusion cannot be drawn absolutely. Hence, experts are not allowed to give their opinions upon the case where the facts are controverted, though counsel may put to them a state of facts and ask their opinion thereon. It is only by a comparison of all the facts in issue that the expert can venture to express any opinion upon them; whence it follows, as a necessary consequence, that expert opinions are admissible if based upon a state of facts which the evidence on behalf of either party tends to establish." In shorter terms, to make the opinions of experts admissible, they must rest on all the facts relied upon to establish the theory claimed; they must rest on no controverted facts, whatever that may mean; next, they must rest on a state of facts which the evidence on behalf of either party tends to establish. This is a sad jumble of things not much calculated to edify the reader. The author may say it is not his fault that decisions are contradictory or impracticable; that he gives them as he finds them, and is responsible for nothing more than their literal correctness. To this we reply that the object of his book is to enlighten his readers, and if he leaves them as much in the dark as before, he has, certainly, to that extent failed of his object. He had better have said, we apprehend, that in some States, as New York and Pennsylvania, the opinion of the expert must be based on all the evidence, supposing it be true. In other States, his opinion must be given, not on the facts in evidence, but on a hypothetical case presented by the counsel. In some cases he has been allowed to consider all the facts as true; in others, he

has been required to leave out of the account all controverted facts. It might have been added that when courts have discarded the old method of requiring the expert to hear all the testimony, and give his opinion on that, supposing it true, they have launched upon a sea of subtleties and refinements, and, after much beating about, generally have brought up very near the place from which they started. The author, however, approves of this course, availing himself of the hackneyed objection, that by the other method of putting the question, the expert is made to assume the functions of the jury. We could never see the grounds of this distinction. To allow the expert to give his opinion on the whole testimony as he has heard it, supposing it true, must have the same effect, essentially, as to require him to give his opinion on an hypothesis embracing those same facts. The difference is much like that between tweedledum and tweedledee. The latter method, however, may thwart rather than serve the purpose for which the expert is called. The court and jury wish from him information respecting the case on trial, whereas, this method allows him to speak about any other case but that. In practice, the counsel make up an hypothetical case to suit their purpose. By putting in some features of the actual case, by colouring some and omitting others, they present a case so nearly like that on trial as to confuse and mislead the jury. If the objections to the old method can be obviated in no other way than this, it had better be retained. Such, in fact, is the opinion of some eminent jurists, Judge Redfield, for instance. (*On the Law of Wills*, 152.)

Our author intimates that the expert *must* give the grounds and reasons of his opinions in order to make them admissible. Of course he must if required, but otherwise, we have often observed, they are allowed to go to the jury for what they are worth. We regret that the author did not improve the opportunity, as every medical man should when he has it, to expose the curious absurdity which characterizes the theory of skilled testimony. The court and jury being entirely ignorant in regard to certain matters of special study and experience, and consequently unable to estimate the significance or force of facts connected therewith, the law permits them to obtain the requisite information from experts, who are required to give the grounds of their opinions, in order that the court and jury may be able to judge for themselves whether they are sustained by the alleged facts. The latter being entirely without skill or knowledge on the subject, they are supposed to be competent to appreciate exactly the relation between the opinion and the facts, and so virtually they become extemporized experts, ready to pass judgment on the opinions of the regularly constituted expert, as if the reasons for an opinion were necessarily intelligible to everybody however ignorant of the subject. We do not imagine that any change, in this respect, will occur during the present generation, but that is no reason why men of science should forego any suitable opportunity to proclaim their conviction, that frequently the rule in question is neither practicable nor necessary.

In regard to the compensation of experts, our author leaves us in doubt whether the expert may insist upon an adequate remuneration. He cites one English authority to this effect, but we apprehend the right of compensation is not universally recognized in American courts. In many, if not most States, the law makes no provision for paying the expert anything more than ordinary witnesses are allowed. For many days together he may be kept from his business, giving to the State the benefit of his learning and experience, and receive for it all hardly enough to pay his tavern bill. As if this were not indignity enough, he sometimes incurs a degree of forensic odium by accepting something like adequate compensation from the party employing him, utterly destructive to the value of his testimony. Of course, lawyers know that a suitable remuneration for professional services does not imply subornation of perjury, but they also know that in the mind of the average jurymen it does imply that or something very like it, and with a kind of strategy that seems to be honourable enough at the Bar, they bring out the fact, under the license allowed to cross-examination, with an effect about as damaging to the witness as if he had been shown to be an old convict or an associate of thieves and rogues. We are surprised that the profession have made so little effort to obtain their

rights in this respect. Judicious and persistent action on the part of State Medical Societies and other medical bodies, would finally succeed, we have reason to think, in getting from the Legislature such a law as they now have in Massachusetts, for instance, which provides a proper compensation to experts for services rendered to the Commonwealth. With such a law, counsel would hardly expect to damage the credit of an expert employed by a private party by asking how much he is to receive.

The tendency of the times to remove restrictions upon the practice of medicine, joined with another tendency not less strong, to increase the measure of responsibility incurred by the practitioner, has led to decisions from which it is impossible to extract anything like definite and settled rules. Of one thing, however, there can be no doubt, and that is that the physician of the present day is at the mercy of every ill-natured patient who, imagining that he had not received from his services all the benefit he had a right to expect, avails himself of the chances of litigation to turn his disappointment to some profitable account. Very naturally, therefore, some of them have thought of protecting themselves against this kind of injustice by means of an immunity bond. Our author thinks, upon the strength of general principles, that such a covenant would avail the physician nothing, in law, although he cites no decision to that effect. We presume he is correct in this opinion, though not for the reason he alleges, "that it is against that spirit of equity which should regulate the transactions of mankind, to allow any one to contract for exemption from the legal consequences of his own wrongful acts; and to no other acts do legal consequences, in the nature of penalties, attach." It is an abuse of terms to call an act wrongful which was accompanied by due care and an ordinary degree of skill. A jury may call it so, in defiance of every principle of justice and common sense, and, therefore, it seems to us, the medical man may resort to any measure of protection which the law allows, without thereby effecting any "derogation of his dignity," or attempting "to pervert the equitable streams of jurisprudence," or evincing "no confidence in his own skill."

In following a tangled thread of judicial decisions, Prof. O. sometimes loses sight of their relations to one another, and the reader is left with a very confused idea of what it all means. Thus, on the custody of the insane, he says: "The general principle is everywhere recognized, that however insane a party may be, no one has a right to confine him for an *indefinite period*, except by due process of law." In support of this statement, he gives the decision of Chief-Justice Gilchrist, of New Hampshire. And yet this is directly followed by a long extract from Chief-Justice Shaw's decision in the Oakes case, maintaining the opposite principle. "These views of Chief-Justice Shaw's," he continues, "were fully confirmed by the Supreme Court of Pennsylvania in the case of *Hinchman vs. Richie*," and there the matter ends. If the reader, after finishing this chapter, has any clearer idea of what the law actually is on this subject, we can only say that he is endowed with a force of penetration to which we can lay no claim. A more intelligible account of the matter, and certainly more conformable to fact, would have been to say that the rule of law respecting the confinement of the insane, depends solely on the caprice of the judge.

The extreme division and subdivision of medical practice into specialties, have introduced much confusion and uncertainty into the law respecting the qualifications of experts. The time has gone by when every doctor was unhesitatingly admitted as an expert in any question of medicine or surgery; but the time is yet to come when the limitations incident to the change in question, shall be exactly defined. Our author gives us but a glimpse of the diversity of opinion on this subject, and the medical reader who pursues his inquiries no further, will hardly be certain that, if called to the witness-stand, he will be allowed to testify respecting ovarian disease unless he has performed as many operations as Dr. Atlee, or a question of insanity without having as many insane under his charge as Dr. Kirkbride. On these points, the legal profession are at present in a muddle, not so fully exhibited by our author as it might have been without wearying the reader. It is a fact worth knowing, for instance, that while in Massachusetts any educated practitioner is competent to express an opinion as an expert on a medical question, the rule is accompanied

by this reservation, as expressed by Judge Thomas in *Baxter vs. Abbott*, 7th Gray, 71, that "the difference is rather in the weight of testimony than in the competency of the testimony." This simple rule, while it sweeps away all the existing difficulties, is founded in common sense and common experience, and is worthy of universal application. A man who has received such a medical education as is now furnished by the regular schools, may be presumed to have some degree of knowledge on all current medical topics. Whether he has had the means of knowing as much as his neighbour, about certain branches of his art, and therefore as competent to express an opinion thereon, is a question very easily settled.

We have a right to complain, too, of the meagreness of the chapter on the mental capacity to make a will. Probably in the whole round of medical jurisprudence, there is no subject with which the physician is more likely to be placed in some legal connection than this. On his knowledge of what the law requires, and on his judgment and discretion, may depend the peace of families and the disposition of property. The amount of wrong to which he may become accessory in advising his patient to make a will, can be equalled only by the mischief that may ensue from the opposite advice. Unless he has his wits about him, quickened by proper information concerning his duty, he will be likely to err on one side or the other. Instead of the three or four pages devoted to this subject, in which he cites not a single decision, he might have given forty or fifty pages, and still preserved the proper proportions of his book. We are happy to say, however, that on one of his few pages may be found a more intelligent apprehension of the real merits of the case than many a judicial decision would furnish.

"The phrase *a will*, conveys no idea, in strict signification, of the mental qualifications indispensable to its validity, any more than the words oration, history, or poem. Because a man is able to speak, it does not follow that he can make an oration; or because he can tell an incident, that he can write history; or because he can make a rhyme, that he can produce poetry. Capacity to make *a will* may imply very different and opposite states of mental power; for it may mean either the ability to make a simple bequest, as, for example, *I give my watch to A. B.*; or it may mean ability to recollect and comprehend the contents of many pages of paper, reciting, besides simple bequests, trusts of various kinds, devises over, contingent remainders, provisions to meet the possibility of issue extinct, and all that the fertile ingenuity of counsel may invent. To ask any subscribing witness or medical expert, before hearing such an instrument read, whether the testator had mental capacity enough to make *a will*, meaning *any will*, simple or complex, is asking them the most ambiguous of questions. For, in contesting the probate of any will on the ground of mental incapacity, the issue is not whether the testator could have made a will in general, or any kind of a will, but whether he had capacity enough to make *the* particular will in question; and until the witnesses or experts know the character of the instrument, so as to be able to appreciate the mental capacity necessary to comprehend the purport of its provisions, it is plainly beyond their power to answer the question in whatever form it may be put."

What a contrast between the principle here so clearly and forcibly expressed, and the arbitrary tests of the old lawyers and the discrepancies and contradictions of their successors, compared with which the "confusions of science," as they are pleased to style an intelligent diversity of opinion among scientific men, dwindle into insignificant dimensions!

In conclusion, we venture to assure Professor O. that if he should resume his labours in a field on which he has barely entered, as we trust he will, he need not fear to make a freer use of his materials, while we would also suggest that a little more care bestowed upon their orderly and skilful arrangement would be duly appreciated by the reader.

I. R.

ART. XXXI.—*Transactions of American State Medical Societies.*

1. *Transactions of the Vermont Medical Society for the years 1867 and 1868.* 8vo. pp. 96.
2. *Proceedings of the Convention for the Organization of the Nebraska State Medical Society, held in Omaha June 24th, 1868.* 8vo. pp. 28.
3. *Transactions of the Medical Society of the State of Pennsylvania at its Twentieth Session, held at Erie, June, 1869.* 8vo. pp. 310.
4. *Proceedings of the Georgia Medical Association, at the Session of 1868, held at Augusta (Reorganization meeting).* 8vo. pp. 20.
Transactions of the Twentieth Annual Meeting of the Georgia Medical Association, held in the City of Savannah, April, 1869. 8vo. pp. 50.
5. *Transactions of the Nineteenth Anniversary Meeting of the Illinois State Medical Society, held in Chicago, May, 1869.* 8vo. pp. 160.
6. *Transactions of the Medical Association of the State of Alabama; Annual Session, 1869. held in Mobile, March; with Proceedings of a Meeting held for Reorganization, in Selma, March, 1868.* 8vo. pp. 144.
7. *Minutes of the Proceedings of the South Carolina Medical Association, at the Meeting convened in Charleston for the purpose of Organization, May, 1869.* 8vo. pp. 18.
8. *Minutes of the Thirty-Sixth Annual Session of the Tennessee Medical Society, held at Nashville, April, 1869.* 8vo. pp. 18.
9. *Transactions of the Indiana State Medical Society at its Nineteenth Annual Session, held at Indianapolis, May, 1869.* 8vo. pp. 70.

1. At the semi-annual session of the *Vermont Medical Society*, held June, 1867, an address was delivered by the Vice-President, Dr. H. D. HOLTON, introducing as topics for consideration, "Medical Education," under which head, among other matters, was included the necessity of some designation by which the standing of a scientific and regular physician can be marked; the initials M. D. being assumed by irregular practitioners of every grade. The subject of criminal abortion was next considered; the alarming increase of the crime referred to; its dangerous effects on population, and upon the health and morals of our females. His next theme was insanity in women, which is so frequently the result of uterine derangement. Necessity of improved facility in our asylums for the insane was indicated. There is a risk of conducting, in such cases, the proper examination, arising from the perverted imagination of the patient, hence the suggestion that there should be a board of consulting examiners for each Asylum, to be called in when deemed necessary by the Superintendent.

The address of the retiring President, Dr. WARNER, at the Annual Session held October, 1867, was principally devoted to historical reminiscences of quackery, and a brief reference to the quack nostrums of the day.

The theme of the address of the President, Dr. C. P. FROST, delivered at the Annual Session October, 1868, was "The Past and the Present of Medical Science." The subject is very well handled, and the sketch of the rapid progress which scientific and practical medicine in all its branches has made within the present century, is interesting and instructive.

The several reports and papers presented at length in the present volume of *Transactions*, evince on the part of their respective authors no little research and observation, conferring credit upon the Society, and upon the medical profession of the State generally.

The essay on "Pyæmia from Gunshot Wounds," by Dr. M. GOLDSMITH, late Surgeon U. S. A., is full and elaborate. He infers after a very careful examination of the subject that the constitutional state termed in medical parlance, pyæmia, is in fact a *septicæmia*, resulting from the admixture with the blood of some putrescent substance generated in the body or absorbed from without.

An account is given by Dr. S. T. BROOKS, of a "Case of Pyæmia from Suppurative Inflammation of the Right Lateral Sinus following Chronic Disease

of Cavity of Tympanum and Mastoid Cells, a sequel to Scarlatina." The case is a highly interesting one, but points to no positive practical result.

A very sensible paper is contributed by Dr. C. P. FROST on "Puerperal Eclampsia," but it sheds no new light upon the causation, prevention, or treatment of the disease.

A case is related by Dr. E. H. PETTENGILL, of "Chronic Diarrhœa cured by the use of Strychnia," which has several points of interest. It occurred in a male aged thirty-seven years, after active treatment for some spinal affection. It yielded only for a short time to the usual remedies, then recurred to the same extent as before; the patient was then put upon the use of strychnia; for several days there was but a very slight appearance of the tetanic symptoms characteristic of the specific action of the article. In the course of four weeks he took $7\frac{1}{2}$ grains of strychnia; he could go now without any disturbance of bowels for some twenty-four to thirty hours. After the lapse of $10\frac{1}{2}$ months he was perfectly well of all bowel complaint.

A very curious instance of the occurrence of "Six Cases of Cataract in one Family," is related by Dr. C. M. RUBLEE.

In a paper by Dr. L. C. BUTLER is presented a very cautious inquiry into the "Decadence of the American Race," as shown by the Registration Reports of Massachusetts, Vermont, and Rhode Island, with its cause and remedy. The fact of the decrease in the progeny of the native stock in the New England States appears to be well established, but in accounting for this decrease, we suspect that too much influence has been ascribed by Dr. B. to the, it is true, fearfully increasing crime of feticide.

The concluding article is a very succinct paper by Dr. A. HARDING, on the "Topography and Diseases of Grand Isle County."

2. The *Nebraska State Medical Society* was organized at Omaha, June 24th, 1868. Of the *Transactions* of the first regular meeting of the Society held in June, 1869, we have seen no account. We feel desirous of an opportunity to test their value.

3. The annual address before the *Pennsylvania State Medical Society*, by the President, Dr. JOHN CURWEN, is devoted to the consideration of the importance of the study by every physician, of the different forms of mental disturbance, their diagnostic signs, their causes, and their moral, hygienic, and therapeutic management. His observations are particularly interesting, being based throughout upon correct views as to the nature of mental derangement, of its etiology, and of the remedial means best adapted for its successful management, as deduced from its clinical study.

Preceding the annual reports from County Medical Societies, we are presented with several reports from special committees, appointed at a former session of the Society.

The *first* of these is on "Intemperance as a Disease." Though by no means as full and complete as the importance of the subject would seem to demand, still the report presents some sound views, which lead to valuable practical deductions.

The *second* report is from the Committee on "Admission of Patients into Insane Hospitals," appointed to procure the enactment by the Legislature of a law establishing the relations of the insane, so as to protect the medical profession in giving certificates of insanity, the insane from improper influences, and the community at large from injustice and oppression. The report states that a memorial to that effect, with the draft of a law, was prepared and presented to the Legislature. The law was passed, but with two additional sections, which the committee consider as particularly objectionable.

The next report is from the Committee on "Inspection of Drugs." The Committee report that they had failed in their efforts to induce the Legislature to enact a law having for its object such a regulation of the business of the druggist and apothecary as will insure to the physician that his prescriptions shall be skillfully and accurately compounded, and of pure and efficient materials.

The *fourth* report is from the Committee on "The Training of Nurses." It

is by Professor S. D. GROSS, of Philadelphia, being in substance the same as that on the same subject read by him before the American Medical Association at its Session in June, 1869.

The *fifth* and last of these special reports is on the "Use of Alcoholic Stimulants by the Medical Profession," as a remedy in the treatment of disease. It presents the subject in a point of view well calculated to attract the serious attention of every medical practitioner.

In addition to the special reports, there is the history of a case of "Rupture of the Uterus," by Dr. J. McCONAUGHY, which, however, illustrates no special point in regard to the accident itself, nor to its proper treatment.

Dr. BENJAMIN LEE, of Philadelphia, next describes "A New Instrument for the Treatment of Lateral Curvature of the Spine."

The concluding portion of the volume before us comprises the reports from County Societies.

From only sixteen counties were reports, correctly speaking, received. For the most part, these are incomplete and unsatisfactory, being confined to the medical history of particular, often very circumscribed, districts of the county from which they purport to emanate, while even these mere local histories are too generally couched in loose, general, and unsatisfactory terms. Still, with all their deficiencies, the reports received are not devoid of interest or of actual practical value.

So far as regards the general health of those portions of the State which the reports before us represent, during the twelve months preceding June, 1869, everything is favourable. There occurred, we are told, no wide-spread epidemic, and the few that did occur, besides being of very limited extent, were mild in character, and attended by a comparatively slight amount of mortality, and the same state of things very nearly prevailed, as we are assured from other sources, throughout those portions of the State from which no reports were received by the Society.

4. The annual address of the President of the *Georgia Medical Association*, (Dr. L. A. DUGAS), April 1869, comprises many judicious remarks in respect to the importance of the association of medical men, as a means of advancing the general fund of professional knowledge, by adding to it new materials, in the form of facts derived from individual experience, and by enabling us to compare the results of the clinical observations of each member upon mooted questions of interest in respect to etiology, pathology, or therapeutics. But we differ entirely from Dr. D., in his estimate of our code of ethics. No one of the provisions of the code can become a cause of estrangement between high-minded, intelligent, and honourable members of the profession. The exclusion of the *unworthy* from professional intercourse with physicians of an opposite character, for which Dr. D. condemns the code, is with us one of its chief recommendations. In no other way can the dignity and moral efficiency of the profession, and the harmonious co-operation of its members in the promotion of the best interests of society at large be so certainly secured.

The reports made at the twentieth annual meeting of the Association were (A) one from a committee appointed at the 19th Annual Session to prepare an address to the public on the "Relation of Charlatans and their Nostrums to Legitimate Medicine." This address is well intentioned, but we very much doubt its authority for the assertion that "to the *dignified* silence (so called) of the profession, the rapid spread of the evil of quackery, is in great part to be attributed." We fear that, with an ignorant public, the reiterated denunciation of quackery and of its nostrums by physicians has been received, to some extent at least, as an evidence of the efficacy of the latter.

A very sensible report (B) was presented by Dr. T. S. POWELL on "Medical Education," in which the recommendation of a course of preparatory instruction in primary Medical Schools made by the *American Medical Association* (session of 1858) is indorsed.

The next report (C) is on the "Importance of the Thermometer to the Physician in his Daily Practice," as a means of diagnosis and prognosis.

5. At the 19th anniversary meeting of the *Illinois State Medical Society*, May, 1869, the following reports were received: 1st. "On Obstetrics," by Dr. H. B. BUCK. This able and interesting report is composed mainly of well-described cases of a highly practical character. The first of the series of cases, two in number, is of *dysmenorrhœa*, in one attended with convulsions; a somewhat remarkable case of *miscarriage*; a case of *uterine hydatid*, simulating pregnancy; case of *prolonged retention of a dead fœtus*; case of *ruptured uterus*, with recovery and subsequent pregnancy; case of *an anencephalous fœtus*; six cases of *anomalous labour*; three cases of *placenta prævia*; a case of supposed *latent metritis*, consequent upon suppressed lochia and resulting toxæmia; a case of *atresia vaginae*, occurring in an infant three months old; a case of *abortion* at four months, followed by premature delivery of a second fœtus, at the seventh month; a case of *traumatic atresia* occurring in a married woman, twenty years of age, during her first pregnancy.

The 2d report, by Dr. N. S. DAVIS, is on "Drugs and Medicines." Dr. D. alludes to the rapidly increasing tendency on the part of pharmacutists to prepare and urge upon the profession and the public, proprietary compounds—elixirs, concentrated powders, fluid extracts, etc., and points to the evils which necessarily result therefrom. In relation to new remedies Dr. D. briefly notices purified opium, svapnia, sweet quinine, carbolic acid, peroxide of hydrogen, ozonic ether, and leaves of the chestnut tree.

The 3d report is that of the "Committee on Insanity," to which was submitted the question: What legislation, if any, is necessary to secure the rights and comforts of the insane previously to their admission to hospital care and treatment?" The committee present a short review of existing laws, with the project of a law designed more fully to determine certain relations of the insane; in order to promote the ends of justice, and to enforce the claims of an enlightened humanity. It is the project unanimously adopted by the *Association of Medical Superintendents of American Institutions for the Insane*, at its annual meeting, June, 1868.

The 4th report is on "Staphyloraphy," by Dr. M. GUNN. The various surgical operations that have been performed for the closure of cleft-palate are described, and their results impartially reviewed.

The 5th report is that of the Committee on "Practical Medicine," by Dr. E. P. COOK. It is very full, able, and instructive, as is also the valuable "supplementary report" from the same committee, by Dr. D. L. JEWETT. Among much that is of a highly interesting character we have, in the report of Dr. Cook, a very full account of the etiology, pathology, march, termination, and best plan of treatment of a disease which has prevailed during several years past in vicinities where the soil is wet and composed of a deep alluvial deposit, not only in Illinois, but in other portions of the United States, and has received the name of *typho-malarial fever*. Dr. Cook considers the disease as in fact typhoid or enteric fever very much modified by malarial and scorbutic influences. In the supplemental report Dr. Jewett gives an account of epidemics of scarlatina and measles that had fallen under his observation.

The 6th report, by Dr. J. S. HILDRETH, is on "A method of Increasing Success in the Extraction of Cataract."

The 7th report, by Dr. E. INGALS, is on "Lenient Medication." It is marked throughout by sound views in respect to the modifications and ameliorations which our general system of therapeutics has undergone of late years.

The report on "Aphasia," by Dr. H. M. HURD, is illustrated by a number of apposite cases.

The report by Dr. E. L. HOLMES presents a "Statistical view of Diseases of the Eye, with a Table of Operations; the necessity of Position in the Treatment of Chloroform Poisoning, and a notice of Sympathetic Ophthalmitis."

The report of the Committee on Necrology closes the volume.

6. The Transactions of the *Medical Association of the State of Alabama*, at its session of 1869, were opened by a neat and interesting Address from the President, Dr. A. G. MABRY, on the History of Medicine, particularly in reference to the State of Alabama.

This is followed by a very full and satisfactory report by Dr. R. F. MICHEL, on "Hemorrhagic Malarial Fever." A malignant malarial disease, following repeated attacks of intermittent, characterized by intense nausea and vomiting, a very rapid and complete jaundiced condition of the surface, as well as of most of the internal organs of the body; an impacted gall-bladder, and hemorrhage from the kidneys. These phenomena present themselves in an almost uninterrupted connection, attended by remissions and exacerbations: the disease is one peculiar to the Southern States. It has received various synonyms, as Black Jaundice; Cachemia Hæmorrhagica; Malignant Congestive Fever; Icteroide Pernicious Fever; Purpuræmia; Yellow Remittent; Yellow Disease; Canebrake Yellow Fever, etc.

Next follows a valuable paper on "Embolism," by Dr. S. D. SEELYE.

The reports from different portions of the State are, in general, well drawn up, and present a useful history of their condition in respect to the amount and character of the diseases prevailing in particular sections of each. Dr. G. A. KERCHUM, Chairman of the Committee on the Diseases of Mobile, remarked that in the latter place, during the year 1868, there had not occurred any endemic or epidemic disease of extended prevalence or of much severity; the health of the city being so good as hardly to furnish matter for a report. He related instead a case of hemorrhagic malarial fever, with pathological and therapeutic comments. Dr. McDANIEL presented an elaborate report on the diseases of Wilcox County. A large portion of which related to a severe epidemic of hemorrhagic malarial fever, with a full account of its symptoms and treatment. The report on the diseases of Dallas County was read by Dr. W. P. REESE. A large portion of it was devoted to hemorrhagic malarial fever, or, as Dr. R. preferred to name it, *Malignant Jaundice*. An essay on the disease was also furnished by Dr. B. H. RIGGS, who prefers to call it *Purpuremia*. Dr. FURNESS read a report, prepared by Dr. MABRY, for the *Selma Medical Society*, which treats chiefly of the hemorrhagic form of malarial fever. Dr. KUMPE read the report of the Committee on the Diseases of North Alabama, entering with some detail into the causes, symptoms, and treatment of the malarial diseases of the Tennessee Valley, with a particular account of that form of the disease attended with hæmaturia, illustrated with several cases carefully reported by various physicians of that portion of the State.

These reports, from so many widely separated localities, all devoted chiefly to *hemorrhagic malarial fever*, prove very evidently that a type of malarial disease, formerly of infrequent occurrence, has, within a few years past, become prevalent to an alarming extent, and indicating clearly that there exists some general cause for its production; which cause is recognized with great unanimity to be "the almost entire neglect of drainage consequent on the changed condition of agricultural pursuits since the war." From several of the counties "Surgical" reports were received embracing many interesting cases.

Among the special reports we have one on the "Increase in the Habit of Opium Eating," by Dr. J. S. WEATHERLY. One on the "Medicinal Properties of the Sulphites and Hyposulphites," particularly their value in the various forms of malarial fever, including the hemorrhagic, by C. F. FAHS. One on the "Treatment of Malarial Fever," by Dr. A. G. MABRY, and another on the "Treatment of Relapses," by Dr. A. C. MATHESON. Both these last papers are of a very interesting character.

The "Annual Address" of Dr. J. B. GASTON, delivered by appointment, discusses the question, "What is Life?" or rather, "What are the Dynamical Agencies of Life?"

7. The proceedings of the *South Carolina Medical Association*, of May, 1869, consisted mainly in the adoption of measures for the effectual reorganization of the Association, under a revised constitution. But few professional topics were introduced, and of these few no details are given.

8. At the thirty-sixth annual session of the *Tennessee Medical Society*, April, 1869, the committee to analyze the different points embraced in the address of the ex-President, Dr. Lipscomb, report, that in the address at least four distinct

suggestions occur, which are clearly set forth, and ably discussed. The first is the importance of confining inter-marriage to individuals of the two sexes who have no strong tendency to disease, who are of different temperaments, and who are not closely related. The second suggestion is the increase of charlatanism, particularly in our larger cities, and the difficulty of arresting it without severe penal enactments rigidly enforced. The third suggestion of Dr. L. is the importance of disseminating a knowledge of human physiology throughout the community by teaching it in our schools, academies, and colleges as an integral branch of common education. The last, but not the least suggestion of the address is the importance of establishing a high standard of medical education to secure which the examination of candidates for the doctorate should be conducted by a board of competent and disinterested physicians, without whose approval no one should be admitted to become a practitioner of medicine. To go one step further back, private teachers should not receive in their offices as a pupil any one who is, either from defect of education or of mental ability to any extent, incapable of mastering a competent knowledge of the science and the art of medicine.

Dr. SEARCY, in a paper in reply to the question, "Can Scarlet Fever be prevented?" related a number of cases he had met with, during a series of years, showing, as he believed, that the tonsils were the part through which the *materies morbi* gained admittance into the system. On discovering in these parts the earliest indications of commencing disease, applying at once a strong solution of nitrate of silver, (3j to water 3j), and repeating it twice each day for several days, with mild laxatives and proper diet, would, he thought, in the majority of cases, mitigate, if not prevent the threatened attack.

Dr. T. L. MADDIN, presented an able and practical paper on "Diphtheria, its history, pathology, and treatment."

Dr. J. MORTON, Jr., read a paper describing the then recent "Railroad Disaster," on the Decatur road near Normandy.

Dr. P. F. EVE read an elaborate account of remarkable cases of "Gunshot Wounds and other Injuries of the Cranium," in which he discussed the relative merits in these cases of heroic and of conservative surgery.

Dr. R. THOMPSON presented a detail of his experience in favour of the use of "Medicated Slippery Elm," in the form of Pessaries and Bougies.

9. The nineteenth annual session of the *Indiana State Medical Society* was opened by an address from the President, Dr. N. FIELD, on the "Troubles and Responsibilities of the Medical Profession."

This is followed by a very sensible paper by Dr. V. KERSEY, in solution of the question, "Why Doctors Disagree?"

Next is a not very complete account of a case of "General Anasarca," with remarks by Dr. J. MOFFETT.

Dr. W. J. ELSTON contributes a paper on the "Digestive Assimilation of Medicines."

A case of "Dislocation of the Femur upwards and backwards," reduced by manipulation, is related by Dr. M. SEXTON, which gave rise to an interesting discussion.

A discussion which took place on "Puerperal Convulsions," though interesting elicited nothing new as to the true character or treatment of the disease.

D. F. C.

ART. XXXII.—*Fœticide, or Criminal Abortion; a Lecture Introductory to the Course on Obstetrics and Diseases of Women and Children. University of Pennsylvania, Session 1839-40. By HUGH L. HODGE, M.D. 12mo. pp. 44. Philadelphia: Lindsay & Blakiston, 1869.*

THIS very forcible protest of the venerable Emeritus Professor Hodge against the destructive evil of criminal abortion, and which is to be viewed as a direct

violation of the laws alike of God and man, was, as its title announces, delivered in the year 1839, as an introductory lecture to the author's course of instruction on obstetrics, etc., in the University of Pennsylvania; and was printed for the benefit of the members of his class and of their friends. Deeming the subject one of very great importance, the lecture was reiterated by Dr. H. to the students composing the class of 1854-55. A new edition of it was then printed and widely circulated.

As many of his former pupils have applied to him for copies of the Essay, delivered in 1839 and repeated in 1854, Dr. H. consented to its republication in the edition before us, believing it to be the duty of every physician who would be true to his professional obligations to exert all possible influences to protect the health and welfare, and to promote the best interests of society. The consent thus given, Dr. H. remarks, is not only to gratify many of his medical friends, but "to contribute, in some degree, to the still further dissemination of those fundamental facts and principles on which must rest all the arguments against criminal abortion."

A few additional observations have been appended to contribute as far as possible "to illuminate the minds of parents, guardians, and all those intelligent and virtuous citizens who superintend the education of youth, or who, in any way, can contribute to form the character of the rising generation or to stay the progress of this alarming social evil."

D. F. C.

ART. XXXIII.—*A Handy-Book of Ophthalmic Surgery*. By JOHN Z. LAURENCE, F.R.C.S., M.B. (Univ. Lond.), Surgeon to the Ophthalmic Hospital, Southwark; Ophthalmic Surgeon to Saint Bartholomew's Hospital, Chatham, etc. etc.; assisted by ROBERT C. MOON, Late Assistant-Surgeon to the Ophthalmic Hospital, Southwark. With numerous illustrations. Second edition, revised and enlarged by J. Z. LAURENCE. 8vo. pp. 227. Philadelphia: Henry C. Lea, 1869.

THE object of the author, as expressed in his preface to his first edition, "to bring the principles and practice of modern ophthalmic surgery within a small compass to supply the wants of the busy practitioner," would appear to have been successfully attained since his second edition now appears under that inexorable law of supply and demand.

Regarding the manual as a brief terse compendium of the established facts of ophthalmic medicine, its value would be fully recognized as a work for ready reference, although a busy practitioner might prefer the perusal of more than one page descriptive of Græfe's method of extraction and its results, before assuming the responsibility of the operation.

For those, however, who must assume the care of diseases and injuries of the eye, and who are too much pressed for time to study the classic works on the subject, or those recently published by Stellwag, Wells, Bader, and others, Mr. Laurence will prove a safe and trustworthy guide. He has described in this edition those novelties which have secured the confidence of the profession since the appearance of his last.

To the portion of the book devoted to a description of the optical defects of the eye, the publisher has given increased value by the addition of several pages of Snellen's Test Types, so generally used to test the acuteness of vision, and which are difficult to obtain in this country.

The volume has been considerably enlarged and improved by the revision and additions of its author, expressly for the American edition, and the publisher has given it to the profession in a substantial and pleasing form.

W. T.

ART. XXXIV.—*A Course of Practical Chemistry arranged for the Use of Medical Students.* By WILLIAM ODLING, M. B., F. R. S., F. R. C. P., Lecturer on Chemistry at St. Bartholomew's Hospital. With Illustrations. From the fourth and revised London edition. 12mo. pp. 261. Philadelphia: Henry C. Lea, 1869.

THIS work having passed to a fourth edition while so many works on chemical analysis, most of them excellent in their character, have been equally successful, shows decisively that the importance of chemical pursuits has taken a strong hold on the public mind. This work is designed for the medical profession, who form a majority of those whose wants have to be thus supplied. Dr. Odling is among the chemists who have stood prominently forward in developing and teaching the doctrines of modern chemical philosophy, although in the first editions of this work the new views were not adopted as a whole, the old atomic weights being still used with much of the old nomenclature. This has been modified in the present, by employing throughout the new system of atomic weights, formulæ, and nomenclature. The account of these views in the introductory chapter on chemical relations is remarkably clear and simple. The remainder of the introduction is taken up with chemical manipulation, an important preliminary step in the instruction of the analytic chemist, who must use not only skill and neatness in all the processes required, but also promptness in the formation and adaptation of means to an end especially in cases of emergency.

The second chapter is on analytic chemistry generally, commencing with general reaction, the use of the blowpipe, solution, and precipitation, distributing the basic bodies into three groups, according to the reactions with sulphuretted hydrogen and sulphide of ammonium, with the special and discriminating behaviour of each. The third chapter is devoted to toxicological chemistry, in which the most important of the inorganic and organic poisons are noticed, with the different tests by which they may be clearly distinguished. The last chapter, on animal chemistry, contains an account of the principal constituents of the organic fluids and tissues, with an account of the urine, both normal and abnormal, the blood, and other animal products. Throughout the work diagrams of apparatus of an improved kind are introduced, together with the appearances of precipitates, etc., under the microscope, whenever this should be characteristic. As a teacher of chemistry of many years' standing, Dr. Odling has necessarily become acquainted with the wants of the student of chemistry, and has fully satisfied these requirements in a small space. The work is written concisely, but still most clearly, and is exceedingly well adapted to the special introduction of the chemical and medical student.

R. B.

ART. XXXV.—*A Manual of Elementary Chemistry, Theoretical and Practical.* By GEORGE FOWNES, F. R. S., late Prof. of Practical Chemistry in University College, London. From the 10th revised and corrected English edition. Edited by Robert Bridges, M.D., Prof. of Chemistry in the Philadelphia College of Pharmacy. With 197 illustrations. 12mo. pp. 857. Philadelphia: Henry C. Lea, 1869.

THE long period which has elapsed since the publication of the last American edition of this work renders the present very acceptable to the American student of chemistry. So rapid has been the progress of chemical science that any exposition, however elementary, of its condition for any one year will in a short time so far fall behind both in fact and theory as to fail to meet the wants of the student of this science. The very favourable reception with which the manual of Fownes has always met, placing it in the foremost rank as authority,

has enabled it to hold its place in public estimation, notwithstanding the defect of not fully representing the present condition of chemistry. It is, therefore, a subject of much satisfaction to a large number of chemical teachers and students that this long needed revision should have been presented in its American garb. The labour required in its preparation, which was almost as great as re-writing the book, has been ably and thoroughly performed by its English editors, Dr. Bence Jones and Mr. Henry Watts, equalling in conciseness of language and lucidity of ideas the original writing of Fownes.

The new matter to be noticed in the preliminary parts, in relation to light and heat, are a general outline of the spectroscope, its revelations and applications, the relations between heat and mechanical force, and the dynamic theory of heat.

The new notation and nomenclature as at present used in Europe are adopted throughout, the atomic weights as differing from the equivalent, being, according to present usage, doubled in many of the elements. A part of the nomenclature used, that of ionic and oxyanionic oxides, produces some confusion in its new application, especially in compounds which have become of public use, such, for instance, as of nitrous oxide given to the third, and not the first oxide, and nitric oxide to the fifth (anhydric nitric acid) instead of the second oxide. Also the prefix di is now used for the second oxide, while formerly it was applied to those cases in which a metallic radical was considered to be in the double atomic relation.

The principles of chemical philosophy have been nearly all rewritten to correspond to the newer views of atomicity and equivalency, or saturating power, comprising also the explanation of the most usual methods by which the differences in equivalent value are denoted both in regard to single elements as well as when arranged in diagrams expressive of constitutional formulæ. In consonance with this idea of equivalency, the elements are arranged under the six classes of monads, diads, triads, tetrads, pentads, and hexads, and although this classification is not adhered to in treating of the non-metallic bodies, it is strictly followed in considering the metals and their compounds. In relation to this part we notice the introduction of new illustrations of improved apparatus.

It is in the department of organic chemistry that the greatest modification, both in arrangement and matter, is to be found, occupying nearly one half the bulk of the work. Considering organic chemistry as in fact the chemistry of carbon compounds, the classification is based on the equivalency or atomicity of carbon itself and its numerous compounds, and the transformations they undergo are considered from this point of view. Commencing with a view of the relations of the homologous and isologous series, and the peculiar nomenclature which has been proposed to distinguish them, the organic compounds are distributed into seventeen classes: 1, Hydrocarbons; 2, Haloid ethers; 3, Alcohols, &c., each of which is subdivided into several series, according to relation in number of the atoms of hydrogen to those of carbon. Under the different heads the most important compounds are described sufficiently to characterize them, and at the same time not occupy too much space. Bodies not at present capable of classification, and compounds derived from the animal kingdom, terminate the work.

To the student of chemistry, who has been educated in the older views of the science, and who has not attentively followed the progress of the past years, the changes here noticed will appear as formidable obstacles to his further progress, but it is to be hoped will not deter him from the examinations of the new views, and although he may not adopt the assertion that it is without doubt more logical, more consistent in its parts, explains phenomena better, and sticks closer to facts, yet he will be rewarded by additional insight into nature's works, and inspired by the hope of a prospective clearing of the confusion that has heretofore pervaded the bounds of organic chemistry.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Contractility of the Lungs*.—M. P. BERT, in a note, communicated Aug. 23d, to the Academy of Sciences, through M. Claude Bernard, states that his experiments justify him in asserting that the tissue of the lungs is contractile and that its contraction is produced by the influence of the pneumogastric. When the pneumogastric is divided in the neck, the peripheral portion loses its power of acting on the lungs, the heart, and the œsophagus. Although the contractility of the lungs is lost, nevertheless the lungs remain perfectly sound, even the vibratile ciliæ continuing their action.—*Gaz. Hebdomadaire*, Sept. 3, 1869.

2. *Cell Elements of the Tendons and Areolar Tissue*.—The *Archives de Physiol.* (No. 4, 1869) contains an important memoir on this subject by Dr. RANVIER. His observations lead to the following conclusions: The connective tissue is essentially formed of connective bundles, of elastic fibres, and of cells. Neither laminæ nor holes can be observed in it. The bundles of the connective fibres are cylindrical, they have a very variable diameter, they are limited by a special layer of annular or spiral fibres. These fibres appear to be a simple thickening of the membrane, thus they are coloured by carmine, and differ therefore from elastic fibres. All the cells are formed of granular protoplasm and contain well-formed nuclei. These cells are placed between the bundles of connective tissue; some, globular in shape, appear capable of moving easily in the spaces left between the bundles; other cells flattened, take up a position along the bundles which they do not easily quit. The stellate cells (*cellules plasmatiques*) seen in transverse sections of dried tendons, are situated at a point where many of the bundles come in contact, and at that spot a nucleus surrounded by protoplasm is situated in a space limited by the exterior of the bundles; the bundles cut transversely form a network-like arrangement, and Ranvier believes in the existence of a canalicular network in which the cells are included. He believes in the existence of a plasmatic circulation in the connective tissue, and, from the presence of cells like the white blood-globules, conceives it to be a true lymphatic circulation, and he suggests the existence of a great space between the bundles of the subcutaneous connective tissue analogous to a serous cavity.

3. *Regeneration of Cartilage by its Perichondrium*.—The recent researches of Dr. PEYRAUD, of Paris, establish not only the possibility of the regeneration of cartilage, but prove, beyond doubt, that this power lies exclusively in the

perichondrium, and this permits of a parallelism between the specificity of this membrane and the periosteum.

The animals experimented on were mostly young dogs, from two to six months old, because the perichondrium at that age is very thick, can be detached without great difficulty, and, as already observed, is more richly supplied with bloodvessels. The cartilage which is most suitable for these experiments is the costal cartilage. Those of the ear or nose give equal results, but require more care on the part of the operator.

For those who wish to repeat the experiments I would say—Make an incision parallel to the direction of the rib down to the perichondrium. Incise this membrane along the middle line of the anterior surface of the rib; pass a sharp spatula beneath the perichondrium, denuding it from the portion of cartilage to be removed, so as to leave an empty sleeve of fibrous membrane.

The result of these experiments—over thirty in number—made by Dr. Peyraud, has been a perfect regeneration of the removed cartilage by cartilage. The chondroplastes were always more numerous and further advanced in their development at the circumference of the rib than in the centre. The two ends of costal cartilage had taken no part whatever in the regeneration; these ends were found rounded off, cone-like, and calcified or ossified. Many of these specimens have been examined by some of our first microscopists (Vulpian, Cornil, Ranvier). Their exactness has also been verified at recent meetings of the Société de Biologie and Société d'Anatomie. The animals were sacrificed from one to six months after the experiments, so that the experimentalist was able to study the regeneration of the cartilage in all its phases.

The same resections practised without preservation of the perichondrium gave negative results in each and every experiment. The perichondrium, therefore, or the anatomical element situated upon its under surface, regenerates cartilage just as the osteogenetic sheet, situated beneath the periosteum, regenerates bone.—*Med. Times and Gaz.*, Nov. 20, 1869.

4. *On the so-called Selective Absorption by the Lacteals and Lymphatics.*—The *Journal of Anatomy and Physiology* (Nov. 1869) contains an article by Dr. W. H. BROADBENT, the object of which is to show that this "Selective Absorption" is apparent only, and that it is another exemplification of the physical process of liquid diffusion.

"The lacteals and lymphatics," he says, "are parts of the same system, the former differing in having a special purpose in relation with the digested food, but in structure and function they are essentially similar, and it will be an advantage to consider them together, the lymphatics presenting the problem of function in a simpler form.

"As to structure it seems now to be very generally admitted that the commencing lymphatic plexuses are simply the interstices between the fibres of the textures from which start delicate vessels with distinct walls. Some observers say that these interspaces have a thin epithelial lining, but this is not important. It is not so evident that the lacteals are mere intertextural spaces; but this is asserted by His on very good grounds, and it is extremely probable that it is so, the greater minuteness and regularity of the network as seen by injections resulting from the arrangement of the glands and crypts of the intestinal mucous membrane. It is clear, whether these commencing lacteals have proper walls or not, that they occupy all the intervals between the capillaries, glands, and fibres, and at most they can have only a delicate epithelial lining. From the structure alone then we should be justified in putting down Selective Absorption as impossible; mere spaces cannot attract any particular substance.

"When the conditions under which the absorption by the lymphatics takes place are considered, it is at once evident that the process is merely passive. Under the pressure of the blood in the arteries, a certain amount of fluid exudes from the capillaries for the nourishment of the tissues. Not only do the tissues abstract from this fluid the materials for their construction, but it is the medium in which the process of oxidation takes place, and in which the products of oxidation and disintegration are primarily found. It is constantly

being charged, therefore, with carbonic acid, urea, &c. We have thus a fluid in the interstices of the tissues containing carbonic acid, &c., and in the capillaries the blood containing oxygen. Mutual interchange of diffusible constituents will necessarily take place in accordance with the law of diffusion till the two fluids reach the same level of composition, and thus by the time the blood has arrived at the venous side of the capillary network it will have lost its oxygen and taken up carbonic acid, &c., converse changes occurring in the interstitial fluid. But while the diffusible products of oxidation thus find their way from the interstitial fluid to the blood-current, the non-diffusible colloid matters which have transversed the delicate capillary membrane outwards under pressure, cannot return against pressure, and must remain in the intertextural spaces which are no other than the commencing lymphatics. The lymphatics then cannot be said to exercise absorption in any sense whatever, they simply receive the spare nutrient material which is forced onwards by the continued exudation of fresh fluid from the capillaries, and finds its way along the vessels to the thoracic duct.

"Examining now the conditions under which Lacteal Absorption occurs, we have the intestinal mucous membrane bathed in the products of digestion consisting of salts, sugars, peptones, and fats in solution or suspension in water, together with the constituents of the digestive fluids. The epithelium and subjacent structures are saturated with these matters, and they all, even the fatty substances in small proportion, find their way into the capillaries. We do not perhaps altogether understand the one-sided diffusion which results in the transfer of all the soluble contents of the intestine to the blood, but we are justified in referring the general absorption from the intestinal surface to the osmotic process, aided possibly by pressure. Without, however, dwelling on the passage of the various products of digestion through the epithelial layer and basement-membrane, it must be pointed out that in order to enter the bloodvessels, a second membrane, the capillary wall, must be traversed. All the matters, salts, sugar, albuminose, and fat, must in fact on first penetrating the basement-membrane find themselves in the interstices of the textures, *i. e.*, in the interspaces which, whether lined by epithelium or not, constitute the commencing lacteal plexus, and they will pass thence through the capillary wall in the order of their diffusibility, salts most rapidly, then sugar, then peptones, and lastly, fats. A small proportion of the fatty matters is found to enter the blood in this way, but being greatly inferior in diffusibility even to the peptones, the fat is left behind in the intertextural spaces by the other constituents, and by its predominance arising in this way gives the chyle its characteristic composition and properties.

"The lacteal absorption is thus not selective and special, but general and residual, and the office of the lacteals is not the abstraction from the mixed contents of the intestine of the fat as an ingredient of special value, but to prevent the waste of this valuable ingredient by providing a readier mode of access to the blood in the place of the slow diffusion through the capillary walls which would result from its high osmotic equivalent."

5. *An Investigation into some Points of the Anatomy and Physiology of the Cervix Uteri, the Glands of its Mucous Membrane, and a Function of the Cervix unconnected with Delivery.*—M. DESPRES, Surgeon to the Lourcine Hospital, read a memoir, having this title, at a recent meeting of the Imperial Academy of Medicine.

The following are his conclusions: 1. The cervix uteri contains glands distributed in bunches or ramified tubules, having their seat partly in the muscular substance of the uterus, like the prostatic glandules in the midst of muscular fibres. 2. These glands secrete a clear, viscid, albuminous liquid, analogous to the prostatic liquid, which issues from the cervix in an intermittent manner, giving rise to ejaculation on the part of the female. This "uterine liquid" issues slowly from the cervix, remaining within its cavity and at the os uteri. It has hitherto been improperly regarded as a variety of catarrhal fluid. 3. The object of ejaculation in the woman is to furnish a vehicle for the spermatozoa in order to insure their safe arrival within the cavity of the uterus. 4.

These glands of the cervix become obliterated during pregnancy, and constitute cysts or Naboth's ovules. But delivery replaces matters as they were by rupturing the cysts during its progress or during the subsequent retraction of the uterus. 5. The cervix of the uterus is erectile, entering into the condition of erection simultaneous with the other erectile female organs, and partially opening to enable the uterine fluid to issue.—*Med. Times and Gaz.*, Nov. 27, 1869.

6. *The Presence of Sulphocyanides in the Blood and Urine.*—DR. LEARED, in a paper read before the Royal Society (*Proceedings of Royal Society*, No. 114, 1869), states that from the examination of the saliva of fifty individuals taken consecutively, he has established that in the saliva of the great majority of persons a red colour is struck with perchloride of iron, a reaction which is due to the presence of sulphocyanide of potassium. It was ascertained that the existence of carious teeth is not requisite for the production of this reaction, because it occurred in many instances in which all the teeth were sound; also that tobacco-smoking was not indispensable, because the colour was produced in many cases in which the individuals never used tobacco. It was also remarked that in all the cases in which the absence of the sulphocyanide was noted, although no definite disease was apparent, the health was feeble, and that, on the other hand, a marked reaction with iron usually corresponded with the ordinary indications of sound health.

Dr. Leared has detected a sulphocyanide in the urine averaging about one-eighth of a grain in sixteen ounces of normal urine—and also in the blood of man and all other vertebrate animals. As far as he has been able to determine the sulphocyanides exist only in the serum, and this leads Dr. Leared “to the consideration of that much-vexed question, the cause of the red colour of the blood. So far as concerns exact colour, nothing more closely resembles blood than a solution of sulphocyanide of iron. This is *prima facie* evidence that red blood owes its colour to this iron compound. The iron is known to be localized in the globules. These are surrounded by a fluid containing sulphocyanic acid in a combination which easily yields the acid when required. Such is the theory at present suggested.”

“I am not unaware of the difficulties in the way of its acceptance. The colour of hæmatin cannot, it is said, depend upon the iron it contains, because nearly the whole of the iron may be removed without affecting the colour of the hæmatin.” But it is not stated that all the iron is ever removed, and it may be that a very small proportion suffices for the formation of the colour, while the larger proportion of the metal is held in reserve in the globules in the same manner as sulphocyanic acid appears to be in the serum.

If Dr. Leared's experiments have been rightly interpreted, it is certain that sulphocyanide of potassium or sodium is not a mere product of the salivary glands.

Carefully conducted experiments proved that sulphocyanide of potassium neither possesses the power of preventing ordinary fermentation nor that of checking it when already in action, but that it does possess an antiseptic power; but whether or not this property comes into operation in the alimentary canal is a question not yet decided.

7. *Urine of the Infant.*—DR. POLLACK (*Jahrb. f. Kinderheilk.* New Series, II.) gives the general results of his examination of the urine in a large number of infants at the breast, aged between eight days and two and a half months. The urine from the males was received in an appropriate utensil, and from the females it was drawn off by the catheter. The quantity varied between 250 to 410 CC. It gave an acid reaction. The quantity passed in twenty-four hours varied from 1 to 2 grm. The uric acid in the twenty-four hours is relatively increased from 0.1 to 0.2 grm. per diem. The inorganic salts are present, but in less quantity than in those of a more advanced age, particularly the earthy

¹ Elements of Chemistry by W. Miller, M. D., 3d edit. p. 872.

phosphates. The urine, in its normal state, of the suckling has a cloudy appearance, from an admixture of mucus. In early infancy the urine has also a much larger amount of sugar than that of the adult, in consequence of the rich saccharine character of the mother's milk. The small quantity of the phosphates, and of the results of the decomposition of albumen in the urine of infancy, results from the fact that these constitute the materials requisite to the building up of the body, and hence are retained in the organism.—*Centralblatt. f. d. Med. Wissenschaftn.*, Jan. 1869, No. 7. D. F. C.

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

8. *Hydrate of Chloral*.—This article has been known to chemists for more than thirty years, but has never been used as a medicine until very recently, when Prof. LIEBREICH, of Berlin, struck with the reaction which takes place in the presence of alkalies, which decompose it into formic acid and chloroform, was induced to hope that the same reaction would take place when it was introduced into the system between it and the alkalies of the animal economy, and thus produce gradually the effects of chloroform. Led by this idea he instituted experiments upon frogs and other animals, and found that it produced in all of them similar results, viz., deep hypnotism, reflex movements of excitement, then entire loss of motion. Restoration afterwards was complete without any stage of excitement. When the dose was too large, the animals died from cardiac paralysis.

Liebreich afterwards studied its effects on man at the Charity Hospital, Berlin. 1.35 gramme by hypodermic injection induced sleep in five minutes in an insane person, which continued for five hours; 3.50 gr. in a glass of water, induced calm sleep in a melancholic man, which continued for sixteen hours.

Langenbeck relates a case of delirium tremens with comminuted fracture of the arm, in which large doses of opium gave no relief. Four grammes of the hydrate of chloral taken internally, and two hypodermic injections of two grammes each, produced a long and quiet sleep.

Dr. B. W. Richardson, of London, repeated the experiments of Liebreich, and in our previous No., p. 538 *et seq.*, will be found a summary of his investigations. This last eminent physiologist has since extended his researches, and in his lectures on Experimental and Practical Medicine (*Med. Times and Gaz.*, November 6, 1869), gives the following summary of the conclusions he has come to from experiments with the article:—

“The effects of hydrate of chloral may be summed up as follows:—

“(a) Deep and prolonged narcotism can be safely produced by the hydrate of chloral.

“(b) During a portion of the period of narcotism there may be complete anæsthesia with absence of reflex actions, and a condition in which every kind of operation fails to call forth consciousness.

“(c) During the narcotism there are intervals of apparent exalted sensibility.

“(d) In the transition from drowsiness to stupor there is no stage of muscular excitement, but in birds there is vomiting, as is common in the same animal in the second stage of narcotism under chloroform.

“(e) During the narcotism produced by the substance there is invariably reduction of temperature.

“(f) The hydrate produces muscular relaxation, which relaxation extends to the muscles of volition and alike to the iris and the muscular arterial system. From the condition of the muscles after death we may infer that this paralysis is in part due to change within the muscular structure itself.

“(g) The action of the substance on the nervous system is primarily on the sympathetic ganglia, afterwards on the cerebrum, and finally on the heart.

“(h) Recovery, when it takes place, is followed by no bad results.

"(i) In fatal cases the functions destroyed are: 1. The cerebral. 2. The voluntary muscular. 3. The respiratory. 4. The heart.

"(j) The substance in small proportions arrests in some degree the coagulation of the blood, and in large quantities stops the process of coagulation altogether. In large quantities it also destroys the blood corpuscles and produces general destruction of blood, but the dose required to produce extreme narcotism need not be so large as to lead to serious derangement of blood.

"(k) The phenomena observed correspond with those observed under chloroform, and the balance of evidence is that they are the result of the action of chloroform.

"*Therapeutical Value of Hydrate of Chloral.*—The last point we have to consider relates to the therapeutical application of the hydrate. I may premise that the dose to the human subject varies, according to the age of the subject or according to the effects desired by the administrator, from seven grains to two drachms. For young children Liebreich recommends seven grains as the dose. For adults, if short intervals of sleep are required, from twenty-five to thirty grains may be administered, and may be repeated every two or three hours, by which a safe and continuous action may be maintained. In cases where more determinative effects are demanded at once, from one to two drachms may be given at once.

"The hydrate may be prescribed in solution with water. It must be well diluted—say in proportion of ten grains to the ounce of water, for it is pungent if not well diluted. The addition of a little tincture of orange, as suggested by Liebreich, is an advantage when the substance has to be swallowed. Altogether, I prefer administration by the mouth rather than by subcutaneous injection. The agent acts quite as well and as quickly when thus administered, and in the same dose. I also myself prefer to prescribe moderate and frequently repeated doses rather than one large dose.

"Liebreich, in his communications, recommends the hydrate of chloral for neuralgia and rheumatism, for convulsive cough and tetanus, for acute mania and delirium tremens, for gall-stones, for removing the pain of small surgical operations, and for local application for the relief of local pain. In cases where there is gastric irritation, as from ulceration, he thinks it should not be administered by the mouth, but should be injected subcutaneously. He seems to have obtained the best results from its use in cases of acute mania and delirium tremens.

"We may ourselves draw the clearest indications of therapeutical value from the experimental facts connected with the action of the hydrate which have been presented to us in experiment. Let us sum up these facts. The hydrate *produces sleep, removes sensibility, brings down the animal temperature, and causes extreme muscular relaxation.* Taking these facts as our guide, we may reasonably put it to the test for the relief of various diseased states and conditions.

"1. Because the hydrate *produces sleep*, it may be employed in cases of sleeplessness and excitement where opium or other narcotics are objectionable. It may thus be used in acute mania, in delirium tremens, and possibly during hysterical excitement.

"2. Because the hydrate *relieves pain*, it may be administered as a substitute for opium, or independently, in cases of suffering from acute pain, as in neuralgia, rheumatism, cancer. It may also be used for the same intention in surgical cases attended with much suffering, and may be carried in such cases, when required, to the extent of rendering a painful part sufficiently insensible to admit of its being altered in position or readjusted. We often have cases of painful disease of joints—strumous disease of the knee-joint, for example—where an agent like the hydrate of chloral may become of the greatest service for the purpose just described. The same application may likewise extend to the treatment of compound fractures where it is important that the injured parts should be moved without the excitement attendant upon suffering.

"3. Because the hydrate *reduces the animal temperature*, it may be tested, with every probability of advantage, in cases where there is rapid increment of heat—fever—with restlessness and excitement. I select cases of surgical fever

as cases singularly happy in illustration of this position. In examples where accident or surgical operation is succeeded by heat of body with constant pain, sleeplessness, and tendency to delirium, I can imagine no treatment better than the administration of moderate and frequently repeated doses (say twenty to thirty grains every two hours) of the hydrate. Under its influence sleep would be induced, pain and excitement relieved, temperature brought down, and undue waste suspended. What is more, the tendency of the agent is to maintain the fluidity of the blood, and thus to prevent the most dangerous of all occurrences in acute disease, separation and deposition of fibrine in the circulatory system.¹

"4. Because the hydrate *produces extreme muscular relaxation*, it may be reasonably employed in various cases, medical and surgical, where it is necessary to overcome muscular resistance or spasm. Thus it may be employed in tetanus, in cases where there is passage of gall-stone, and, I should think with special advantage, in strangulated hernia. In this latter case it would have a double meaning. It might be employed not only for rendering reduction by the taxis easy, to the avoidance of an operation, but if operation were afterwards unavoidable, it would tend to remove the pain of the operation and to be of service to the operator by sustaining relaxation.

"It is unnecessary for me to trouble you with further suggestive details. The physiological action of the hydrate of chloral understood, its applications will occur equally to all; I shall therefore be content simply to record that the external use of chloral for the relief of pain as recommended by Liebreich does not, according to my experience, correspond with its usefulness as an internal remedy. I find that when applied to the skin it creates some irritation, and in a typical case of superficial and local neuralgia, where I have employed it for a week with great care, it has had no effect in relieving the pain of the sufferer."

In Paris the hydrate of chloral has attracted great attention, and numerous experiments have been made with it, but with contradictory results. This M. Bouchut attributes to the greater or less purity of the substance used by different experimenters. He says that chloral should be used in the state of solid hydrate; and that when it is pure, the results are rapid, manifest, and energetic; these are the most calm hypnotism, and almost absolute insensibility. In *L'Union Médicale* (Nov. 13th, 1869) the researches of M. Bouchut are summed up as follows:—

"Hydrate of chloral is a powerful sedative of the motor and sensitive nervous system. The dose should not exceed five grammes for adults, and two grammes for children. It may be administered by the mouth, but its effects are more prompt when given by the rectum. Injected hypodermically, it gives rise to formidable eschars. The urine during the sleep induced by chloral is neutral, and when boiled with Fehling's liquor it does not reduce the salts of copper. But twenty-four hours after awakening, when it contains chloral, it is more dense, and reduces the salts of copper, so that a temporary glycosuria which does not exist might be suspected. The action of chloral is that of chloroform, but it is longer in being produced, and lasts for a longer period. In some subjects it gives rise to an intoxication resembling that of alcohol, but in no wise of so disgusting a character. In almost all it produces sleep, which is rarely accompanied by hyperæsthesia, a deep anæsthesia being present in the great majority of cases. This is usually in proportion to the quantity employed, and in a dose of from two to five grammes, according to age, it is complete enough to allow of the application of cauteries without pain being felt, and even of the extraction of teeth. As a therapeutical agent it is a sedative in the violent

¹ "Since this lecture was delivered, my friend Mr. William Adams, struck with the above suggestion, and with the view of acting upon it, consulted me respecting a case of compound fracture and commencing surgical fever in a man under his care in the Great Northern Hospital. I recommended that the hydrate of chloral should be administered in doses of twenty-five grains every two or three hours until the temperature of the patient, which had risen to 102° Fahr., was reduced to the natural standard. The treatment was carried out by Mr. Adams with the most satisfactory results."

pains of gout and the severe suffering arising from nephritic colic or dental caries—in fact, the first of anæsthetics administered by the stomach. It is also the most prompt and effectual remedy in severe chorea, when the object is to arrest convulsions that menace the safety of the patient.”

M. DEMARQUAY, who was the first in Paris to experiment with chloral, questioned its anæsthetic properties, though he admitted that it was a most excellent hypnotic, and he denied the transformation in the economy of chloral into chloroform. The more recent experiments of MM. PERSONNE and ROUSSIN, however, as communicated to the Imperial Acad. Med. (*L'Union Méd.*, Nov. 30 and Dec. 2, 1869) show the correctness of Liebreich's statement that chloral, when it reaches the blood, undergoes decomposition under the influence of the alkaliescence of that fluid, and is decomposed into formic acid and chloroform, and is ultimately converted into chloruret of sodium and formiate of soda, which thus form the products eliminated. Further, if chloral be mixed with blood recently drawn from the vein, and maintained at the temperature of the body, no odour of chloroform is perceived; but if a current of air is caused to traverse the mixture, the odour is immediately apparent. In contradiction to M. Bouchut, M. Personne maintains that chloral is never met with in the urine, and of this he has no doubt whatever. As to the reduction of the cupro-potassic liquid mentioned in proof by M. Bouchut, it should be known that in consequence of the urates which it contains, urine will always reduce the copper, providing the ebullition be continued long enough. Neither the presence of chloroform, nor even of glucose, is requisite for this.

M. Léon Labbé and M. Goujon confirm the hypnotic effects of chloral, and state that when given in sufficiently large doses it is also an anæsthetic, producing at first, sleep, and afterward anæsthesia.

MM. DIEULAFOY and KRISHABER have likewise been experimenting with chloral, and in a communication to the Imperial Acad. of Medicine (Oct. 4), state the following as their conclusions:—

1st. Chloral, in weak doses, excites sensibility; in strong doses it gradually diminishes sensibility, and brings on complete anæsthesia. 2d. The animals in which anæsthesia is brought on pass through a preliminary condition of excitement. 3d. When anæsthesia has been general and absolute, the animals remain in this condition during several hours, and then die almost immediately. 4th. The sleep may be attended by hyperæsthesia or anæsthesia; in the latter case resolution is complete. 5th. Chloral modifies deeply the number and rhythm of the heart's movements; it gradually diminishes the action of the diaphragm; heat is notably diminished. 6th. The phenomena excited by chloral are in many points different from those produced by chloroform, though anæsthesia is the same in both cases.

In a second communication, M. Léon Labbé thus states the result of his researches: 1. Chloral, when introduced in sufficient quantity into the blood of an animal, produces anæsthesia, but without that preliminary condition of excitement which obtains with chloroform. 2. When introduced into the alimentary canal, or under the skin, it produces first sleep, and then anæsthesia, but in a lesser degree than when directly introduced into the blood. 3. In these cases there is some slight irritation, but nothing to be compared to hyperæsthesia. On account of the various circumstances above stated, he does not believe that chloral is transformed into chloroform.

As will be seen, these two series of experiments differ in their results, not only from each other, but from those already published by Liebreich, Richardson, Demarquay, Personne, and others.

These differences, no doubt, result partly to the experimenters being too hasty in announcing their conclusions, and partly as suggested by M. Bouchut, to the degree of purity of the article employed.

M. GIRALDES, of the Hôpital des Enfants, who has been experimenting with chloral with the care which characterizes his investigations, stated in a communication to the Surgical Society of Paris, that so far as he had been able to see, chloral would become an invaluable auxiliary in cases of nervous symptoms of a traumatic origin, where it is desirable to possess a therapeutical agent which has not the stupefying properties of opium. He added that chlo-

ral cannot compete, as an anæsthetic, with chloroform, because it allows the reflex actions to subsist, which chloroform destroys and annihilates. This view he founds on the following facts: He had administered the substance to two children of about three years of age, one of whom he had intended to operate on; the other presenting, subsequently to amputation, a condition of extreme sensibility. Chloral was given in a dose of two grammes to ten grammes of distilled water, with a *quantum sufficit* of ordinary syrup. Both children were thrown into a deep slumber, which lasted several hours, and from which they could scarcely be aroused; but as reflex movements were easily obtained on pinching the skin, M. Giraudeau decided not to operate.

Dr. CH. EHRLH, of Wurtemberg, formerly *chef de clinique* of Dr. Niemeyer, has also administered chloral to man, and relates (*Medicinisches Correspondenz-Blatt. des Württembergischen ärztlichen Vereins*, Sept. 18, 1869) three cases in which he employed it. His first case was that of a man æt. 51, with chronic myelitis, who, for several months had suffered from the most severe pains in the loins and paralyzed lower limbs. The frequent exacerbations of pain compelled him to change his position every quarter of an hour, and rendered sleep infrequent and short. The bromide of potassium, morphia, and baths all failed to afford any benefit. To relieve the patient from his painful condition Dr. E. determined to give him at five o'clock in the evening of the 15th of August last, two scruples (2.60 grammes) of the hydrate of chloral in simple syrup and water. In a few minutes sleep was produced which continued for four hours, during which the patient moaned and complained, but on awakening he had no knowledge of having done so. The pains in the loins were lessened until the next morning whilst those in the feet recurred after midnight with their usual intensity. Neither headache, bad taste in the mouth, nor irritation in the urinary or respiratory organs was afterwards experienced, and the patient praised the medicine.

The subject of his second case was a woman, æt. 40, affected for four years with *tabes dorsalis*. An interesting circumstance in this case was that the patient was delivered of a vigorous boy three years after the cessation of her menses. She experiences none of the subjective phenomena of pregnancy; she did not perceive the motions of the child, and during delivery suffered no pain. It was necessary to deliver her with instruments. The patient exhibited none of the physical phenomena which would lead to the suspicion of general paralysis. Moreover, she had the characteristic symptoms of incoördination of motion with conservation of muscular power. Her fingers, lower limbs, and back were destitute of sensibility. She had pain around her waist. The fear of tumbling out of bed made her keep a light in her chamber all night. When she desired to grasp an object, she had constantly to guide her hands by her sight; she could not walk except with difficulty and supported by two strong persons. She complained of pains in the lower limbs and a sense of constriction and heat in her back. During the night she could not lie more than a quarter of an hour in the same position, and her sleep was incessantly interrupted and was attended with painful dreams. Dr. E. gave this patient on the 17th of August, at 8 P. M. a half drachm of hydrate of chloral in sweetened water. Immediately afterward the patient eructated gas smelling of the medicine, and she thought at the time that she should vomit; afterwards she fell asleep, and with two short interruptions at 10 P. M. and 1 P. M., she slept until 5 A. M. calmly and free from dreams. On awakening the patient felt strengthened. No ill effects from the medicine followed.

His third case was one of violent neuralgia, which, on account of its regularity, Dr. E. thought particularly appropriate for studying the action of the medicine. The subject of it, æt. 57, had suffered from neuralgia for 20 years, recurring regularly twice a year, generally in August and December, continuing from three to six weeks. The paroxysms occurred at first every two or five minutes; but for some years they came on only every ten or fifteen minutes. The pain was constantly seated in the ramifications of the superior maxillary nerve in the upper lip, the lower eyelid, the alæ of the nose, and the incisor teeth of the right side. For some years after the extraction of a tooth the pain extended to all the teeth of the upper jaw. Sometimes it radiated to the

forehead, temples, and teeth of the lower jaw. The vault of the palate and the point of emergence of the mental nerve, have also been so sensible to pressure that pressure brought on a paroxysm. During the paroxysms the patient experienced a sensation of intense burning in the tongue. He asserts that he could lessen and even remove the pain by rubbing with a piece of linen the lower part of the right side of the face. Latterly the neuralgia recurred, and as the patient derived no benefit from all imaginable narcotics, Dr. E. had recourse to chloral. At half past seven P.M. of the 15th of Aug. he administered two scruples of hydrate of chloral, which was followed by sleep in a quarter of an hour. The intelligent patient stated that he first felt the calming effect of the medicine in the diseased part. His sleep was quiet and free from dreams. Respiration and pulse normal. The patient slept for five hours, when he awakened with pain, but soon went to sleep again and slept for five hours longer. When he awakened the pain seemed as on the previous days. Besides, the patient complained a little of coryza and irritation in the throat. On the 18th of Aug. at half past 9 A. M. two scruples of hydrate of chloral were again given in water and syrup of orange-peel. He slept until 11 o'clock, when his wife, who had misunderstood Dr. E.'s directions, awakened him to administer another dose of chloral which had been ordered to be given at night. The patient again slept until two o'clock, when he was awakened for dinner. He ate with appetite, after which he had a paroxysm of neuralgia, but soon went to sleep again. At 7 P. M. Dr. E. visited him; he did not awake. His sleep was calm, respiration and pulse normal. The urine which he passed in the afternoon did not smell of chloroform. A half hour after Dr. E. left, the patient was awakened for supper, after which he had some pains, but again fell asleep, which continued until after midnight. Between one and five o'clock in the morning he was awake and did not experience any suffering. After five o'clock the pains recurred. The patient lauded the medicine and desired it to be continued, notwithstanding its high price.—*Le Movement Médical*, Oct. 24, 1869.

Dr. J. H. BARNES has administered chloral in the Liverpool Workhouse Hospital to ten patients labouring under delirium tremens, and he considers that "while not altogether a perfectly reliable agent, it is, so far as experience points, capable of procuring, in most cases a very rapid and peaceful state of sleep, and capable of administration without trouble or danger in exact definite quantities." A summary of these cases, with Dr. B.'s remarks, will be found in the *Medical News* for the present month.

Dr. Jacobi, of New York (*Medical Record*, Dec. 1st, 1869) has administered chloral as an hypnotic in the human subject in five cases, in four with the happiest results. The fifth showed a single unpleasant symptom, pain in the ears, apparently due to the irritant effect of the drug, insufficiently diluted, upon the mucous membrane of the throat, which was chronically inflamed.

It is proper to add that M. J. V. Laborde, in a communication made to the Imperial Academy of Sciences, asserts that the administration of chloral is not free from injurious results. Given to a healthy man in progressive doses of from 1, 1½, and 2 grammes, daily, he states that chloral induces, especially on the second or third day, an extremely painful sensation at the pit of the stomach, severe colic, nausea, lipothymia, and profuse sweating. Those experiments, which were made upon himself, M. L., did not think it incumbent upon him to carry further.—*Archives Générales de Méd.*, Dec. 1869, p. 758.

We have now laid before our readers a full summary of the existing knowledge respecting the hydrate of chloral—an agent which is at present attracting much attention, and which undoubtedly possesses very powerful hypnotic properties. Whether or not its administration be attended by danger—in what doses it should be given, and in what diseases it will prove most beneficial, are questions which can only be decided by future experience; but from the number of experimenters now at work with this article these questions will doubtless soon be answered.

9. *Medicinal Uses of the Salts of Atropia.*—Prof. BUIGNET has recently directed attention to the various uses of atropia as a general remedy, and not merely in affections of the eye. Two salts of the alkaloid are used in medicine

—the sulphate and the valerianate. The valerianate is formed by mixing a cooled solution of atropia in ether with a cooled solution of valerianic acid, and from this mixture crystals of the required salt soon crystallize. Acting on the long-established axiom in therapeutics that a combination of two similar remedies almost always produces a greater and more rapid effect than an equivalent dose of either of the single remedies, Dr. Michea, as long ago as 1853, made trial of this salt in “affections of the nervous system,” and especially in cases of epilepsy. His account of the action of this salt was so favourable, that a commission was appointed to investigate the subject, and their report was that valerianate of atropia is decidedly preferable to many of the so-called antispasmodics, and that it offered the great advantage of replacing two drugs notoriously variable in their action—belladonna and valerian—by a combination of their active principles, which was far more steady and certain in its action. The method of administering it is in granules, each of which contains a milligramme, or about $\frac{1}{7}$ th of a grain, of the salt. One granule daily is the proper dose to begin with in an adult, and in the course of a week a second granule may be taken daily. This is the maximum dose, any excess inducing dilatation of the pupil and disturbed vision. The author quotes the names of more than twenty physicians who have written to confirm the value of atropia and its salts as therapeutic agents. Taken internally, the salts of atropia have been found serviceable in the treatment of epilepsy, chorea, neuralgia, hysteria, tetanus, intermittent fevers, and those forms of disease of the respiratory organs in which the nervous system is specially involved, as asthma, hooping-cough, and certain forms of nervous bronchitis.

It has been found by Bouchardat and Crosio that cases of severe neuralgia, in which opium, henbane, and sulphuric ether have failed to give relief, have yielded to the local application of an ointment composed of five centigrammes (three-fourths of a grain) of atropia and four grammes (about a drachm) of lard. Pescheux has reported a case of tetanus which he cured by the aid of subcutaneous injection of sulphate of atropia, and Béhier, Richard, and other French physicians have practised the same treatment with success in cases of severe localized pain. One part of sulphate of atropia may be dissolved in 100 of water, and from one to five drops injected. Slight symptoms of belladonna poisoning sometimes exhibit themselves in these cases, but are merely transitory. The smaller dose should be first tried.—*Med. Times and Gaz.*, Nov. 20, from *Nouveau Dict. de Méd. et de Chirurg. Prat.* Art. *Atropine*.

10. *Action and Uses of Ipecacuanha*.—Dr. C. D. PHILLIPS extols (*The Practitioner*, Nov. 1869) the efficacy of the simple powdered ipecacuanha and its wine. It is, he justly considers, an exceedingly safe emetic, and is an unquestionable diaphoretic, whether given in the form of Dover's powder or vinum ipecacuanhæ.

It “exerts a power over all diseased mucous membranes in checking profuse mucous secretions, whether from the air-passages, the alimentary canal, or the genito-urinary apparatus. It is a most useful remedy in spasmodic coughs attended with profuse mucous expectoration and vomiting, especially in those troublesome coughs, accompanied by vomiting, which are incident to pregnancy. Its beneficial operation is clearly discernible in most cases of continued and obstinate retching or vomiting, where the stomach is not primarily affected, but disturbed by sympathy with some other part or organ of the body, whether the primary affection be acute or chronic. There are cases of sickness and spasmodic cough during pregnancy, accompanied by ulceration of the uterus, which fail to yield to it; but in many of these cases it will succeed if a few doses are administered before the patient raises her head in the morning.”

He states that he “has now before him twenty-three carefully recorded cases of whooping-cough. In most of these the cough came on in violent paroxysms, continued until a quantity of viscid mucus was ejected from the lungs by the mouth, and often by the nostrils, and increased in intensity until the contents of the stomach were evacuated.

“In all these cases, where the vomiting had been more troublesome than the whoop, ipecacuanha has given very marked relief.

"The dose recommended is half a drachm of the vinum ipecacuanhæ in four ounces of water, a dessert-spoonful to be taken every one, two, or three hours, according to the severity of the cough. Children under five years old should only take a teaspoonful of the same mixture, but many children of this age can tolerate, and are benefited by, much larger doses.

"In the capillary bronchitis of children, even when complicated with croupy symptoms, it acts well. In these cases the writer orders ʒss of vinum ipecacuanhæ to four ounces of water, a teaspoonful to be taken every one or two hours, or much more frequently if the symptoms are urgent.

"In many cases of nocturnal spasmodic asthma, in which hours are spent in great distress, with livid face and lips, loud wheezing throughout the chest, and want of breath, causing fear of suffocation, if there is no organic disease of the heart or the lungs, ipecacuanha will give quick and marked relief. Five drops may be taken as a dose, repeated every ten to thirty minutes for two or three hours, unless relief comes much sooner, in which case the dose should be diminished and taken less frequently. Care should always be taken to avoid its emetic or nauseating effect.

"In these affections of the lungs, its expectorant and antispasmodic character cannot be doubted, nor its curative action in controlling and stopping the abnormal secretion of mucus.

"Hemorrhage in the early stage of tubercular phthisis, and in most stages of this disease, when produced by engorgement of the bronchial mucous membrane, and accompanied by little or no acceleration of pulse or increase of temperature, is often readily stopped by ipecacuanha. In hæmatemesis arising from vicarious menses, and also in some cases of menorrhagia, it is very useful.

"In many cases of dysentery it lessens the bloody and mucous discharge, and removes the cutting pains and tenesmus, especially in the early and late stages of the disease. In cases of dysentery or diarrhœa, where nausea, vomiting, or retching exists, ipecacuanha will stop the sickness, and at least control the dysentery or diarrhœa. The watery diarrhœa during dentition, the diarrhœa with green evacuations, and the dysenteric diarrhœa, which are so common among children, rapidly yield to this drug. Vinum ipecacuanhæ is effective in dysentery and diarrhœa, but the writer has preferred the pulvis ipecacuanhæ, considering its action more speedy and trustworthy.

"It is more necessary to vary the dose in dysentery than in any other class of cases, one grain every one or two hours being quite sufficient with some persons, whereas others require ten, twenty, or more grains as a dose. These larger doses sometimes, when first administered, bring on vomiting, which it is well to avoid; but if the patient is kept lying on the back, and the dose persevered with, it can generally be tolerated, and a rapid recovery often follows.

"In the diarrhœa and dysenteric diarrhœa of children, one-fourth to one-half of a grain, with a little white sugar, at intervals of one to three hours, is generally sufficient, but the quantity must be increased if necessary."

11. *Physiological Effects of Curara*.—Prof. PAUL BERT (*Archives de Physiol.*, No. 5, 1869) has made some curious observations on a curarized dog. After paralysis appeared, artificial respiration was started, and continued regularly by means of the ingenious apparatus of M. Gréhant. The right vagus and sciatic nerves were then exposed and tied. During the succeeding six hours the action of the nerves, the condition of the pupils, &c., were hourly observed, with the following constant results; the pupil of the right side was contracted, while that of the left was widely dilated; galvanization of either vagus caused dilatation of the pupil, with projection of the eyeball and complete stoppage of the heart's action. The left iris contracted under the action of light. An interesting result was obtained when galvanic stimulation was applied to the central portion of the tied (right) sciatic nerve, or to the median nerve, viz: contraction of the bladder, which produced, the sphincter being paralyzed, the voiding of a small quantity of urine. This effect could be produced only through the intervention of the sensory nerves of animal life; for it did not follow excitation of the vagi, the sympathetic in the neck, nor the splanchnic nerves. The interest of this observation is apparent when its value is

considered in explaining certain well-known phenomena, dependent on the relations between the bladder and the sensory nerves, such as the desire to urinate caused by a sensation of extreme cold, or by entering a bath of cold or hot water. In this experiment also Dr. Bert discovered the presence of sugar in the saliva.—*Journ. Anat. and Phys.*, Nov. 1869.

12. *Physiological Action of Bromide of Potassium*.—Dr. PURSER, of Dublin, gives (*Dublin Quarterly Journ. of Med. Sci.*, May, 1869) the general results of his experiments to determine the physiological action of bromide of potassium somewhat in the following manner: After a stage of temporary excitement, which is not, however, invariably observed, bromide of potassium destroys reflex movement, by an action on the gray matter of the brain and cord. It next destroys sensibility, also by an action on those parts of the nerve centres whose function is to receive and conduct impressions coming from the periphery. The power of voluntary motion is generally retained for a considerable period after the reflex excitability is abolished; but it is likewise eventually lost, and this occurs while the nerves and muscles are yet functionally active. The effect on the heart varies according to the dose and place of injection. If the dose be large and injected in the neighbourhood of the thorax, the heart speedily comes to rest in diastole, before the occurrence of complete suspension of voluntary or even of reflex movement; but if the dose be comparatively small or injected at a distance from the thorax, the heart continues to beat for several hours after movement of every other kind is at an end. The capillary circulation, after a temporary acceleration, becomes slow, and altogether stops before the heart ceases to beat. Respiration is one of the first functions affected, sometimes stopping almost instantaneously on the introduction of the poison; and the respiratory movements of the chest cease before those of the throat. The nerves lose their conductivity at a late period, but muscular irritability is retained for some time after this. Dr. Purser concludes his paper with an account of a few experiments made with bromide of sodium, bromide of ammonium, and iodide of potassium, which appear to show that in physiological action these substances differ considerably from each other, and from bromide of potassium. The experiments were made on frogs only.—*Journ. Anat. and Phys.*, Nov. 1869.

13. *Physiological Action of Delphinia*.—Dr. CAYRADE (*Journal de l'Anat.*, No. 3, 1869) summarizes the results of his investigations into the action of the alkaloidal active principle of delphinium staphisagria, in the following conclusions: 1. Delphinia influences the spinal cord in such a manner as to diminish and then destroy its excito-motor power. 2. This action is produced gradually, and it extends from behind forwards, reflex power disappearing first in the posterior extremities, then in the anterior, and last of all in the head. 3. Voluntary movements continue after the loss of reflex power, but the former become incoördinate before their abolition. 4. Delphinia seems to affect successively the general sensibility, the reflex function, the respirations, and the power of coördinate movements. Its action is restricted to the nervous system.—*Journ. Anat. and Phys.*, Nov. 1869.

14. *Physiological Action of Picrotoxine*.—This active principle of *Menispermum Cocculus* has formed the subject of a recent investigation by Dr. ROEBER, of Berlin (*Archiv v. Reichert und Du Bois Reymond*, 1869, Heft 1, pp. 38–68). He found that in frogs a comatose condition was first produced, and then a series of tetanic spasms, which by and by became clonic. During the stage of clonic spasm, the inspirations were greatly exaggerated, so as abnormally to inflate the lungs; and, on the cessation of each spasm, the air rushed out suddenly with a distinct sound. The heart's action is slowed and the diastole prolonged by picrotoxine. The respiratory movements are at first almost abolished, but they reappear gradually on the disappearance of the spasms. It was found that the occurrence of spasms could not be prevented by removal of the cerebrum or optic lobes; but they never appeared after separation of the medulla oblongata from the m. spiralis. When this operation was performed, picrotoxine

produced a comatose condition in which reflex excitability was retained, but no dyspnœac symptoms appeared, and the heart's contractions were increased in frequency. The spasms are, therefore, dependent on stimulation of the medulla oblongata; and the slowing and even stoppage of the heart's action, as well as the inflated condition of the frog, are caused by this stimulant action affecting the vagus-centre. Accordingly, when the vagi nerves were divided, picrotoxine exerted a less powerful slowing action on the heart. A certain degree of this action was, however, observed, which Roeber refers to an influence on the cardiac motor-centre, as it could be produced even after the peripheral terminations of the vagus were paralyzed by nicotia. Division of the vagi likewise prevented the extreme inflation of the lungs. The activity of the reflex centre is diminished by picrotoxine, and Roeber believes that this effect is due to stimulation of Setschenow's inhibitory centre in the medulla oblongata, for it is not produced after the removal of this centre. The symptoms that appeared in rabbits were the same as those in frogs, only the former animal is more sensitive to the action of this poison than the latter.—*Journ. Anat. and Phys.*, Nov. 1869.

15. *On the Combined Action of Morphia and Chloroform.*—In his recent very interesting lectures before the College of France, Professor CLAUDE BERNARD points out some remarkable and valuable effects which may be obtained by combining the actions of morphia and chloroform (*Revue des Cours Scientifiques*; and *Bulletin Général de Thérapeutique*, Sept. 30, 1869, p. 241). Some years ago, Dr. Bernard had occasion to administer a dose of morphia to a dog recovering from the effects of chloroform, and he was surprised to observe that the morphia reproduced the anæsthetic effect of the previous dose of chloroform. More recently, this experiment was modified, so that a dog narcotized by morphia was completely and quickly anæsthetized by a quantity of chloroform very much smaller than would have been necessary to produce this effect in a dog in normal condition. It was further found, that when the anæsthesia had nearly disappeared, a second dose of morphia almost immediately reproduced it. It is well known that anæsthesia cannot be induced by morphia. This alkaloid exalts the sensory excitability, and induces torpor and narcotism; it never destroys sensibility. Chloroform, however, rapidly suspends the sensory excitability. It is, therefore, somewhat remarkable that the anæsthetic action of chloroform should be increased and prolonged by morphia. Dr. Bernard believes that this can be explained only by supposing that the action of the one substance is super-imposed on that of the other. When an animal is recovering from chloroform-anæsthesia, the quantity present in the blood is insufficient to completely suspend sensibility, although it is sufficient to greatly diminish it; but as morphia blunts the nervous sensibility, it aids the action of the chloroform, and thus a quantity of the latter, in itself insufficient to produce complete anæsthesia, becomes sufficient to do so when assisted by morphia. Bernard points out that this combination admits of several valuable applications, and that, indeed, it promises to be the best method of inducing anæsthesia. By administering a dose of morphia before commencing the inhalation of chloroform, anæsthesia is induced without any initiatory stage of excitement, and without incurring the risk of those accidents which are occasionally caused by large doses of chloroform.—*Journ. Anat. and Phys.*, Nov. 1869.

16. *Action of Veratrin.*—A very careful investigation of the therapeutic properties of veratrin has recently been made by M. PEGATTAZ, who has published his results in the *Deutsches Archiv für Klinische Medicin* for last month. He describes its effects both when taken internally and when subcutaneously injected; and finds them almost precisely the same, being as follows: In the earlier stage, excitation; subsequently depression. Then follow in succession salivation, nausea, sensation of choking, vomiting, and usually diarrhœa. The voluntary movements become unsteady, the want of power displaying itself first in the posterior, and subsequently in the anterior, limbs; accompanying this there appeared to be a certain degree of stiffness. There were coincidentally

exaltation of the reflex sensibility and diminution of the sensibility. The temperature, the number of the respiratory acts, and of the beats of the heart, were all transiently diminished. Convulsions and tetanus finally set in; but careful examination failed to discover any indications of inflammatory mischief. Experiments made with a view of testing its applicability as a remedy which might be used hypodermically, seem to have been unsatisfactory; showing that whilst it acts in this way similarly to its operation when given by the mouth, yet the injection produces very great pain.—*Lancet*, Nov. 13, 1869.

17. *On the Influence of Chloroform in Promoting Cutaneous Absorption.*—From a number of experiments detailed in the *Practitioner* for December, 1869, Dr. AUGUSTUS WALLER, of Geneva, deduces the following conclusions:—

1. Chloroformic solutions applied to the skin of man and animals are quickly absorbed, and produce local and general results according to the substances employed.

2. Alcoholic and aqueous solutions are either not at all or very slowly absorbed.

3. Chloroform easily traverses the dead skin by diffusion.

4. Alcohol does not traverse the skin, but produces an endosmotic current with water.

5. Skin exposed to chloroform in a state of liquid or vapour absorbs a considerable quantity of it.

6. On traversing the septal skin of the endosmometer, chloroform carries with it a certain amount of any alkaloid dissolved in it.

7. These observations sufficiently explain the rapidity of cutaneous absorption during life, without our having recourse to any problematic influence of sebaceous matter on the surface of the skin.

In the course of his experiments Dr. W. discovered that it was necessary for cutaneous absorption that the heart's action be not in any way diminished, for if it be, no absorption takes place, even after a prolonged immersion. This is owing not so much to the absence of local absorption in the skin, as to the deficiency in the vascular action; for if we remove the skin of a part that has been immersed, we can detect in its inner surface the presence of the dissolved substance, which, however, from the deficient means of transport in the vessels around, has remained localized and inert in the system.

18. *Absorption of Iodide of Potassium by the Skin.*—Dr. FERRAND refers to a case of iodism occurring in private practice, as a consequence of the application to the skin of dry iodide of potassium. This fact, besides showing the possibility of the absorption of dry substances by the skin, affords a new means of administration of this important remedy. The case was that of a female who was attacked by inflammatory symptoms in the pelvic region, accompanied with purulent evacuations through the rectum. After a careful diagnosis, it was established that these symptoms were due to the presence of an immense pelvic abscess, occupying all the space behind the uterus and the broad ligaments. Dr. Ferrand wished to combine with the local symptomatic treatment the internal use of iodide of potassium in pretty strong doses; but in a few days very distinct symptoms of iodism obliged him to desist, although the fitness of the remedy appeared already manifested by a sensible improvement in the condition of the patient. Scarcely had the iodic phenomena ceased, when the re-administration of the iodide appeared to be justified; but it became necessary to suspend it again after three days. It was then that Dr. Ferrand thought of the application of dry iodide of potassium. With this view he made the patient put on a shirt which had been previously dipped in a solution of two drachms of iodide, and then dried. After three days this shirt was replaced by a second, prepared in the same manner; but towards the end of the fourth day the iodic symptoms recurred. These symptoms were coryza, lachrymation, a sense of weight and pain over the frontal sinuses, a sense of occlusion of the posterior nares, muscular pain extending over the whole region of the neck, constant nausea accompanied with frequent vomiting, and smart fever. All these phenomena corresponded, in fact, with those previously observed during the in-

ternal iodic treatment; and although they appeared after a longer lapse of time, when the remedy was applied externally, yet they remained more pertinaciously, showing that if the action of the medicine were a little less prompt, it acted more deeply and persistently than was the case when administered according to the usual method.—*Edinburgh Med. Journal*, Nov. 1869, from *Bull. Gén. de Thérap.*

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

19. *Recent Researches on Phthisis*.—Dr. J. BURDON SANDERSON, well known by his important researches on artificial tuberculosis (appendix to reports of medical officers of privy council for 1868 and 1869; and preceding No. of this Journal, pp. 545–47) in a paper very recently published (*Edin. Med. Journ.*, Nov. 1869), which has especial interest at the present time, remarks: “In studying the development of consumption in man, it becomes more and more apparent that three distinct agencies are at work. Of these agencies one is so ill defined that we can only designate it a tendency. To some minds, I am aware, to talk of a constitutional tendency seems meaningless. I am not going to assert the possibility of disease existing absolutely independently of material change, but I do assert strenuously that disease may exist without its being possible to detect any anatomical or chemical basis for it. As regards pulmonary consumption, the fact of its so frequently attacking in succession several members of a large family shortly after adult life affords to me a proof beyond the possibility of dispute, that something phthisical exists in each such member. In this sense I believe in the existence of latent phthisis, but in no other. No proof has yet been given that, in individuals in whom this tendency exists, the solids or fluids are differently constituted from others. The latent condition can only be described as a tendency or liability, the nature of which is open to speculation.

“The second agency is irritation. The organs which are subject to injury are, above all, the mucous cavities which communicate with the external air. A common bronchial catarrh, not differing in any respect except its result from other bronchial catarrhs which terminate favourably, gradually assumes the characters of consumption. In the cases in which tuberculous processes originate from catarrhal inflammations of the genito-urinary organs, the same thing happens. Gonorrhœa leads to prostatitis, prostatitis to scrofulous catarrh of the bladder, which creeps upwards along one or both ureters, and produces induration and caseation of one kidney—that condition which is called renal phthisis. In both of these instances an indurative process, which ultimately becomes disintegrative—*i.e.*, a tuberculosis—begins from a simple catarrh of irritative origin.

“The third agency is that which I have designated throughout as *infection*. The word designates the fact, that whenever a chronic induration due to overcrowded corpusculum exists in any organ, it is apt to give rise to similar processes elsewhere.

“Although this is the point which artificial tuberculosis serves to illustrate, the notion does not owe its origin to the results of experiment. It was distinctly formalized at least twelve years ago by Buhl almost in the terms in which we are now disposed to accept it. Buhl, however, limited its application to cases in which there are miliary tubercles. He showed, in the first place, that in persons who die of that variety of fever which is characterized by the general dissemination throughout the body of miliary granulations (acute miliary tuberculosis), masses of induration, which have remained in the body long enough to become caseous, are in the great majority of cases to be found; and *secondly*, that in those cases in which miliary tubercles are sown over a much more limited region, as, *e.g.*, when they are confined to a single organ, they also spring from old lesions.

"Both of these doctrines of Buhl's are, I think, well established, and will be accepted by most pathologists, provided they are not overstated.

"They do not, however, include the ordinary case of phthisis, for the instances of phthisis in which typical miliary tubercles are to be found are comparatively very few in number. The position I wish to advance is that *infection* has to do with the development of ordinary consumption—in short, that Buhl's doctrine applies in a certain sense to the so-called infiltrated forms of induration as well as to the miliary.

"The results of experiment, as I have said, help us to understand this. If inoculation had produced only miliary lesions, we might have been disposed to *limit* infection to such lesions. The facts are otherwise. By inoculation you get miliary granulations in the serous membranes and in the choroid, but interstitial or diffused lesions in the liver, lungs, and other massive organs—so that here interstitial induration is part of an unquestionably infective process.

"By regarding the development of so-called infiltrated gray tubercle as infective, one gets rid of some difficulties. We are no longer compelled to accept the teaching of some of the French followers of Virchow, who restrict the term tuberculosis to what is called 'granulie,' or to draw too marked a line of distinction between cases of phthisis in which miliary granulations are present and those in which none can be found—or, with Niemeyer, to refuse to apply the term tuberculosis to any excepting certain rare forms of consumption.

"As to the word tuberculosis, obviously it would be a great advantage pathologically to get rid of it, as having no anatomical or chemical basis. At the same time, it must be admitted that it has a practical value, as implying a particular kind of malignancy. This malignancy stands in close relation to the infection of which I have been speaking, and, in particular, to that crowding together of new growth, whether catarrhal or adenoid, which is the essential character of an infective focus.

"In other words, if *tuberculous* as applied to any organic disease means anything, it means destructive induration—*i.e.*, that the organ is first hardened, and then becomes softened and indurated. This, for example, is the only respect in which tuberculous disease of the testicle, of the kidney, of the bone, and of the lungs all agree.

"Here I must leave off abruptly. In conclusion, let me observe, that in my judgment the question of specificity is not one of merely theoretical interest. The doctrine has, I believe, exercised an unfavourable influence both on the treatment of phthisis, and on the management of phthical patients. It has led men to forget that consumption is influenced by the ordinary causes of inflammation, not only in its origin, but in each step of its progress; and that one most important aim in treatment must be to counteract this influence—not, of course, by returning to the antiphlogistic remedies of the past, nor indeed by any therapeutical interference whatsoever, but by bestowing on the treatment of acute catarrhal affections, whether of the pulmonary, intestinal, or genito-urinary mucous membranes, a great deal more care than has hitherto been considered necessary; and, on the other hand, by affording to the poor when actually suffering from acute disease of the lungs the means of placing themselves under protection without delay from the injurious action of cold or occupation."

20. *Experiments on Animals with the Inoculation and Ingestion of Different Organic Substances, and Principally Tuberculous Products.*—Dr. DUBUISSON read a note to the Acad. de Med., August 10th, on this subject. His experiments were performed with the assistance of MM. Tillaux, Villemin, and Grancher. Dr. D. gave a summary of his experiments, and drew from them the following conclusions:—

1. The inoculated matters are generally harmless: the nature of the matters employed do not influence the result.
2. They sometimes quickly produce derangements, and occasionally cause death by a sort of poisoning.
3. In some cases they produce lobular pneumonia, which is, perhaps, consecutive to the inoculation, and which may be confounded with tubercles.

4. Tubercular matters given as food produce sometimes the death of the animal as if poisoned by septic matters.

5. Generally animals fed with tubercular lungs experience some *malaise* from this unwholesome food, but they do not become tuberculous.

Our experiments show then that tuberculosis is in its nature neither virulent nor contagious as regards the animals experimented on.—*Archives Générales de Méd.*, Sept. 1869.

21. *Severe Injury to the Anterior Convolutions of the Brain without Impairment of Intellect or Power of Speech.*—Mr. FAIRLIE CLARKE exhibited to the Pathological Society of London (Nov. 2, 1869) a boy, aged twelve, who had met with an extensive compound comminuted fracture of the right parietal and frontal bones, with laceration of the brain and loss of brain-substance. The accident occurred on the 19th August. Two portions of bone, each the size of a penny, were removed; and a lacerated wound was found extending deeply into the anterior convolutions. From this wound the substance of the brain exuded, and in the course of a few days a hernia cerebri, as large as the fist, was formed. The early symptoms were those of shock and compression, but in twenty-four hours the boy began to recover sensibility, and from that time forward continued to amend. By the careful use of compresses and bandages the hernia was reduced, and the gap in the skull rapidly healed over. Mr. Fairlie Clarke drew attention to the interesting physiological fact that the anterior convolutions of the brain can be so much injured without producing any apparent effect upon the intellect, the power of speech, or the special senses.

Dr. ROBINSON referred to several cases reported as having occurred in the Peninsular War, and in which there were no marked cerebral symptoms.

Mr. HULKE stated that a case of the kind was admitted last year into the Middlesex Hospital, and did well, without impairment of the mental faculties. He had met with another case several years ago.—*Lancet*, Nov. 13, 1869.

22. *Heterotopia of the Gray Substance of the Brain.*—E. K. HOFFMAN describes, in Henle and Pfeufer's *Zeitschrift*, No. 34, 1869, the case of a woman 69 years old who laboured under incipient dementia and died with symptoms of collapse. Upon examination after death a new formation of the gray substance of the brain was detected. The anomalous gray portion was in the form of a prominent tumour of the size of a hazelnut, seated between the corpus striatum and thalamus opticus of the left side, and extending inwardly into the ventricle. There was also found in the anterior lobes of both hemispheres, imbedded in the white substance, from four to five small grayish-red spots. There were opacity of the pia mater, and a warty thickening of the other meninges, with spots of induration in the substance of the thalami and corpora striata; a diminished capacity in the ventricles, and slight adhesions of the dura mater spinalis with the pia mater. By a microscopical examination of the new-formed matter it was found to be similar in structure to the normal gray matter. In the corpora striata and thalami the ganglion cells were loaded with fat and degenerated pigmentary matter, while the spots of induration were imbedded in a very thick basement tissue, beset with numerous granular cells and amyloid granules. Upon the bloodvessels of the brain there was observed a thick coat of adventitia.—*Centralblatt. f. d. Medicin. Wissenschaft.*, No. 21, May, 1869.

D. F. C.

23. *Abscess of the Brain.*—Dr. MAAS (*Berliner Klinischer Wochenschrift*, 1869, Nos. 13 and 14), describes four cases of abscess of the brain. In one, it was doubtful whether the fluid collections found in the anterior portion of the left lobe of the cerebrum were not more properly speaking the result of the softening of a tumour (*Myxosarcoma*), than a true abscess. In two cases, examination after death revealed a number of abscesses which occurred in cases of mortification after the operation for resection of the head of the femur, at the hip-joint. In the two remaining cases, there was traumatic injury of the skull. In both the trephine was employed. In one the contents of the abscess, which

was very large and seated in the right cerebral hemisphere, were not discharged. In the other case free exit was given to the contents, but after a while the flow of pus suddenly ceased, but the discharge was reinstated by enlarging the opening. The patient, a male 23 years old, finally recovered. A bone plate was applied to close the opening in the cranium.—*Centralblatt. f. d. Medicin. Wissenschaft.*, No. 29, June, 1869. D. F. C.

24. *Sleep apparently continued for more than Seven Months; Simulation of Death.*—The details of this case are given by M. LEGRAND DU SAULLE in the form of a lecture, and are of unusual interest.

The patient, Della F., was an Italian, aged 32 years, tall and healthy, employed for several years in the same store as porter, where he had always borne a good character for honesty, industry, and sobriety; but was somewhat retiring in disposition, and miserly in his habits. In June, 1868, it was noticed that his manner had become preoccupied, absent, and strange; later, great restlessness manifested itself, and it was evident that he was labouring under religious excitement. In July his peculiarities had increased and he began to neglect his work. On the 31st of July he seems to have become a raving maniac, for abandoning his occupation and taking with him 1500 francs—the savings of many years—he promenaded the streets, talking and gesticulating wildly, and finally threw his money into a dirt cart which happened to pass by. While kneeling in the street he was run over by a carriage and sustained a fracture of the fibula. He was at first taken to the Hôpital Beaujon, but was afterwards transferred to Bicêtre and placed under M. Du Saulle's care. The following note was made at the time of his admission: "He was uneasy, anxious, and much overcome. He scarcely answered any questions, and manifested a desire to die and at the same time a fear of dying as well as of being eternally damned. He ate little—wept, bewailed his lot, and scarcely slept. Very soon after his admission he was visited by the priest, who seems, by his injudicious exhortations, to have increased very much the religious excitement under which he was labouring. On the 8th and 9th of September he partook of the communion, and afterwards extreme unction was administered to him. On the 10th the patient was found in the attitude of a man in a profound sleep, and this condition seems to have begun at the time of, and to have continued since, the administration of extreme unction." On the 11th the following note was made: "Della F. is in the dorsal decubitus, his limbs are rigid and contracted, his respiration is frequent and rather diaphragmatic than costal; his pulse is 72; his eyelids are drooping and occasionally winking, and his jaws are tightly closed one against the other. The sensibility is blunted; immobility absolute since yesterday. The patient has several times passed his urine involuntarily." The condition above described continued unaltered, except that later the sensibility of the skin seemed somewhat increased. It was evident, however, that there still existed a state of semi-consciousness, and to a certain extent the power of voluntary action. "For, whenever the patient believes himself alone and unwatched he puts his left hand from under the bedclothing in search of the sheet, which he seizes and throws over his head, and this action he repeats as often as the sheet is rearranged."

In regard to the diagnosis M. Du Saulle thus expresses himself: "The patient is, in my opinion, a victim to a sort of internal delusion; the sacrament has been administered to him; he either believes himself dead or wishes to be thought so; he obstinately throws the sheet over his head and maintains, without the least movement, the position of a corpse in a coffin." By the advice of M. Luys, one of the physicians to the Bicêtre, a large blister was on Nov. 4 applied to patient's scalp; while it was drawing, he suddenly assumed the erect position, and with a voice broken with sobs, exclaimed, "My God! my God! have pity on me! I am undone, I shall die. My God! my God! I shall die, my brethren! Pray to God for the repose of my soul." Before, however, the nurse could light his lamp he had fallen back on his pillow and had assumed his usual posture. During all this time it was of course necessary to feed him by introducing food through an œsophageal tube.

On the first of February he was etherized. Drunkenness was produced

with great difficulty—was very slight and passed away rapidly, although the operation was very well performed. While under the influence of the ether he seemed uncomfortable—made movements as if he intended to put himself on the defensive; opened his eyes wide and looked at what was going on around him with an astonished and stupid expression, and on two different occasions laughed in a silly manner. During the time that the drunkenness lasted (eight or ten minutes) he was questioned, teased, flattered, and threatened alternately, but he could not be induced to answer a word. Little by little, as the effects of the ether wore off, he assumed his former attitude. Three days later the attempt was made to intoxicate him, and for that purpose a whole bottle of champagne was introduced into his stomach, but the only effect produced was increasing slightly the frequency of the pulse. Cannabis Indica was about this time employed without any other effect than that of increasing the emaciation and causing a discolouration of the skin. The sleeper of Bicêtre having by this time become famous, a notorious magnetizer succeeded, by an application to M. Husson, the Director-General of Public Charity, in gaining access to the wards of M. du Saulle, and in magnetizing the patient; but no results appear to have followed the *passes* which were made over him. An ophthalmoscopic examination made by M. Edward Meyer and M. Bouchut revealed the fact that there was œdema of the optic nerve, and abnormal pallor of the retinal vessels.

On the 12th of April the patient succumbed to an attack of pneumonia.

The autopsy appears to have been made with unusual care, and the following points are of interest: 1st. A marked decoloration of the nervous substance affecting both the white and the gray substance depending upon a general anæmia of the organ which was very apparent even where the bloodvessels are normally most abundant, as in the gray substance of the corpus striatum, the protuberance and cortical substance. 2d. Atrophy of some of the convolutions, which caused in certain positions umbilicated depressions of the undulatory surface of the cortical substance. This condition is never met with except in those who have presented during life persistent trouble, more or less characteristic of the mental faculties, and as it depends upon disappearance to a certain extent of the nervous cellules, this derangement is generally of the nature of dementia. 3. Islets, of partial vascularization, which were found in the thickness of the cortical substance. These were said to resemble, more than anything else, the eruption of measles on the surface of the skin. M. Luys, who conducted the post-mortem examination, is inclined to think that the excessive depression of the phenomena of the life of relation and the apparent absence of all cerebral activity may be explained by the progressive diminution of the capillary circulation through the groups of nervous cellules which induced a condition of positive inanition, and finally extinction of their dynamic activity. On the other hand, the persistence of delusion may be explained by the existence of the foci of partial congestion which kept the surrounding cellules in a state of erethism or of functional exaltation.

One of the most interesting facts in the whole case is, that notwithstanding the number of times the œsophageal tube was introduced (750 in all) not the slightest abrasion of the œsophagus was found after death.

The lecture also contains the full history of a very similar case reported by M. Timermans, of Turin, and some particulars in regard to four other cases, which present some points of similarity.—*Gazette des Hôpitaux*, Nov. 2, 4, 9, 11. J. H. H.

25. *Sudden Death from Excitation of the Pneumogastric Nerve, of the Inferior Laryngeal, or of the Nasal Nerve.*—M. P. BERT, in a note read Aug. 23d, 1869, to the French Academy of Sciences by M. Claude Bernard, states, that when these nerves are strongly excited sudden death may result, without convulsions; respiration and the general movements of the body are immediately arrested and the animal dies as if from a stroke of lightning. M. B. has thus caused death in mammifera and birds, particularly in ducks, which is an important fact, for the suddenness of the death in these last animals shows that it is not owing to asphyxia (ducks resisting asphyxia for from eight to fifteen

minutes). This sudden death is hence probably the result of a cessation of action, of a sideration from too strong a centripetal excitation of the respiratory centre to which the term *vital point*, so much criticized, would be partly justified. However this may be, certain cases of sudden death following too strong excitation of the larynx (ammoniacal cauterization, small foreign bodies) to some attacks of angina pectoris may, perhaps, be thus explained.—*Gaz. Hebdomadaire de Méd. et de Chir.*, Sept. 3, 1869.

26. *Reduplication of the Sounds of the Heart*.—It has been erroneously asserted that the reduplication of the second sound of the heart has no prognostic or diagnostic importance. Dr. A. GEIGEL admits that this symptom is occasionally met with in healthy persons, but he asserts that it is constantly found in a series of patients affected with mitral narrowing and insufficiency. Most of these patients are of middle age, thin, anæmic, and long affected with cardiac disease. In all these a reduplication of the diastolic sound can almost constantly be heard at the points where the tricuspid orifice, the aorta, and the pulmonary artery are auscultated. The two diastolic sounds are more intense over the aortic and pulmonary orifices than over the mitral; the second diastolic sound is also more marked over the situation of the pulmonary orifice than over that of the aortic. The reduplication of the diastolic sound may thus be explained by the occlusion of the semilunar valves of the aorta and of the pulmonary artery not being simultaneous, the valves of the latter closing an instant after the valves of the aorta. In fact the second diastolic sound is more accentuated over the situation of the pulmonary artery than the first.

The retardation of the closure of the pulmonary valves is due to the left ventricle relieving itself rapidly of its blood, while the right ventricle gorged with blood empties itself more slowly. Further, the aorta retracts more energetically and more rapidly than the pulmonary artery, the elasticity of which diminishes from day to day in proportion as the sanguineous engorgement increases. A constant reduplication of the second sound of the heart may serve as a diagnostic sign of the mitral narrowing or insufficiency, but the reduplication of the second sound of the heart may also be produced in all cases in which there is a stasis in the right heart, or dilatation of the pulmonary artery. It is manifest that in this latter case the symptom will not be so constant as when there are valvular alterations. Reduplication of the diastolic sound is also observed in young, robust persons affected with tuberculosis, in those who are emphysematous, in pleurisy, and in fatty degeneration of the heart.

Guttmann, without denying the assertions of Geigel, nevertheless attributes much less importance to the sign in question. He does not consider the reduplication of the second sound of the heart as an habitual sign of mitral contraction; on the contrary, he regards it as a rare phenomenon, never constant, and only to be observed when the patient is in complete repose. When the heart is excited to full activity, the reduplication disappears.—*Archives Gén. de Méd.*, June, 1869, from *Verb. de Worzb. Med. Gaz.*, and *Virchow's Archives*, 1869.

27. *The Urine in Yellow Fever*.—The urine of yellow fever patients has been most attentively examined with the hope that it would furnish a means of diagnosis and prognosis. The experiments of Dr. BALLAT in three hundred cases satisfied him that during the first stage of yellow fever the physical and chemical characters of the urine are the same as in other fevers. But in the second stage the urine, as the disease becomes developed, assumes more or less of a deep brown colour and viscid consistence. Subjected to nitric acid or heat an albuminous precipitate is obtained; the abundance of the albumen varying according to the progress of the disease. If the termination is to be fatal, it increases until death; if favourable, the amount of albumen gradually decreases.

Dr. VIDAILLET has published in the *Archives de Médecine Navale* (1869), some additional observations, and insists on the value of albuminuria as a means of diagnosis. He states that there occur in the Gulf of Mexico, where yellow fever prevails, two other fevers, bilious remittent and intermittent fevers,

the symptoms of all three of which at their onset are the same, but require very different treatment. Hence the importance of discovering a means by which yellow fever may be diagnosticated. Dr. V. sought for this desideratum in the modification of the urinary secretion. He remarked that as the quantity of urine diminished the urea and uric acid also diminished, and at the same time albumen could be detected, at first, however, only in small quantity. As the quantity of albumen increased, the traces of urea and uric acid diminished, and ultimately entirely disappeared, as did also the colouring matter of the bile.

Dr. V. has observed that when into a glass containing about 150 grammes of urine, passed by a man twelve or twenty-four hours after an attack of yellow fever, some drops of nitric acid be poured along the sides of the vessel, there is immediately or a few moments afterwards, found a whitish albuminoid zone, dividing the fluid into two parts; the upper layer consists of urine the colour of which is unaltered, the lower layer has a reddish tint, while the lowermost portion of all has assumed a yellowish-orange, or curaçoa colour. This whitish opaline zone, which Dr. V. calls the premonitory ring, he considers as the least doubtful diagnostic sign at the commencement of yellow fever, one which is never found in the two other fevers. It may vary in thickness; it is soluble in an excess of acid, or rather it becomes of a greenish-brown from below upwards. According as it disappears the urine becomes effervescent, and this effervescence is an additional important character, for it occurs only at the commencement, or at the decline of the disease when it is to terminate favourably.

The examination of the urine of a great number of cases, enables Dr. V., he states, to assert that when the ring does exist, the case is not one of yellow fever. He has further observed, that the albumen can be detected twelve hours after the ring occurs in the urine. The albumen undergoes modifications according to the progress of the disease; at first it floats, afterwards it becomes denser, and finally is precipitated to the bottom of the vessel by nitric acid. At first it is opaline, almost transparent, requiring some amount of the reagent to determine its presence; afterwards it is so dense that a single drop of the acid suffices to produce a precipitate like pus, the albuminous coagulum at this time is no longer homogeneous, but is composed of distinct milky-white granules. When the disease is going to terminate favourably, the albumen recommences to float, and passes through the successive transformations which it had previously undergone, from the ring at the onset of the disease, which he then terms the ring of decline (*retour*); and the colouring matter of the bile reappears, exhibiting its characteristic colours; at the same time there may be noticed a return of the effervescence: all these concur with the diminution in frequency of the pulse, which falls below 60, prognosticating the favourable termination of the disease.—Condensed from *Archives Générales de Médecine*, November, 1869.

28. *Hemorrhage from Mouth and Anus of New-born Infants*.—Dr. SPIEGELBERG, in a recent number of the *Jahrbuch für Kinderheilkunde*, relates two cases of the so-called *melæna* in new-born infants. In both instances the infants were to all appearance healthy at birth. In one, on the fourth day, and in the other after thirty hours, there occurred a copious discharge of blood by the mouth and per anum. In both cases death ensued within a few hours, under symptoms of anæmia. Upon post-mortem examination, in both cases there was found in the duodenum ulcerations from the size of a lintseed to that of 1 cm. long by $\frac{1}{2}$ cm. broad. Dr. S. refers these ulcerations to a diseased action commencing during uterine life.—*Centralblatt. f. d. Med. Wissenschaft.*, September, 1869.

D. F. C.

29. *On Feeding by the Nose in Fever*.—Every physician must be familiar with a complication of fever, especially typhus, which frequently occurs, viz., real inability, or obstinate refusal from delusions, to swallow the milk, beef-tea, etc., so absolutely necessary to successful combating of the disease. Mr. TENNENT, of the Glasgow Fever Hospital, recommends (*Glasgow Medical Journal*, November, 1869) in preference to all the artificial methods heretofore adopted,

that of nasal feeding, by passing a gum-elastic catheter through the nose into the œsophagus, and then using an ordinary glass syringe. The nasal passages present an entrance over which the patient has no control whatever, either during or after introduction. The only conditions to be attended to in its use are: 1st. To oil it. 2d. To see that it is not too flexible, as if so, it is apt to bend in all directions and thus be more difficult to pass. 3d. To remember that it may be passed into the larynx; its presence there generally produces irritation and coughing; and, moreover, air passes through the catheter. 4th. After the catheter is introduced, to watch that it does not slip back through the nares. A string attached to the catheter will guard against this possibility. 5th. If the catheter is not readily passed by the one nostril, try the other.

30. *Uræmic Diarrhœa*.—Dr. J. M. FOTHERGILL remarks (*British Med. Journ.*, Nov. 20, 1869) "In congestion of the kidneys, the flow through the convolute capillaries is impeded, and the excretory action of the kidneys is thus lost, and the blood becomes laden with effete products and water; thus altered in its physical properties, it flows sluggishly and stagnates in the capillaries, including those of the intestinal canal; spontaneous catharsis comes on, and the balance of the circulation is restored. In chronic renal disease, this becomes more necessary, and is frequently manifested. The inefficient action of the renal secreting cells, together with dilated, constricted, or thickened capillaries, produce frequently an impeded circulation; congestion and further impeded flow follows; the depurative action of the kidneys, for the time being, is held in abeyance; and blood-poisoning ensues."

Diarrhœa, therefore, in these renal conditions, Dr. F. considers to be of greatest service, freeing the blood from its retained effete products.

"Whenever, then, diarrhœa occurs in a person," he says, "presenting the appearances of renal disease, and more especially if there be present albuminuria, or the symptoms of any renal congestion, it may be desirable to hesitate about arresting the alvine flux until some other channel be patent. From the known intolerance of opium in renal disease, preparations of the solanaceæ should be administered where the suffering is great. The skin should be immediately acted upon by the hot air bath, or otherwise; hot poultices, sprinkled with mustard, should be applied across the loins when the bath is over. Nutritive support should be given; and a mild diuretic of digitalis, and citrate of potassa in infusion of buchu or calumba, may be administered as soon as the kidneys are somewhat relieved. If a little flux remain, a few grains of powdered cassia or cinnamon may be prescribed, and the more powerful astringents should only be administered when the danger to life is imminent; and, of these, a mixture of sulphuric acid and infusion of logwood, is perhaps the least objectionable. But astringents should be used warily and cautiously; absorbed into the blood, they astringe and arrest the activity of the bowels, but, at the same time, check and impede the action of the renal secreting cells, whose restored and renovated activity it is of the utmost importance to keep up. The action of the skin must be fostered, and the patient carefully protected from atmospheric changes, to which these sufferers are very sensitive; and, as soon as convenient, the patient must be given steel, and the other adjuncts to nutrition. In the first mild case which occurs, I shall feel inclined to try a combination of nitrate of potassa, nitric ether, and pernitrate of iron. Which-ever plan be adopted, it is desirable, while affording the maximum amount of benefit, to eliminate, as far as possible, the elements of danger."

31. *Scleriasis*.—Dr. JOHN K. BARTON records (*Dublin Quart. Journ. Med. Sci.*, Aug. 1869) a case of this rare disease, of which three cases, it will be remembered, were reported by Dr. Arnold in the No. of this Journal for July, 1869.

M. J. C., a girl æt. 23, was admitted into Adelaide Hospital, in April, 1869, "on account of a hoarseness, and feeling of pain, and constriction in her throat, which had then lasted about three weeks, and seemed to be increasing in intensity. Upon examining the throat externally, the neck was found to be the seat of a peculiar kind of diffused induration, which extended across the larynx in front,

and laterally as far back as about the edge of the trapezius muscle, the back of the neck feeling natural; the larynx seemed to be the centre of this induration, and felt larger than natural, while at the same time its prominent cartilages could scarcely be distinguished. When pressed, the patient complained of pain, but the swelling at all other parts of the neck was painless; the affected skin was pale, and of natural temperature. Upon further examination the induration was found to extend down over the skin of the chest as far as the mamma, the upper part of which was hard, but the skin over the lower part of these glands was supple and healthy. Upon turning to the face to see if the disease had involved it at all, it became apparent that the skin over the entire face had a smooth, tightened, peculiarly drawn look, which made it almost impossible to pinch up the skin, and gave a remarkable expression to the countenance. When told to frown, the patient's utmost efforts could only produce a slight wrinkling of the skin of the forehead, while smiling produced creases around her mouth, such as might be the result of folding parchment.

"The only history the patient could give was, that about four months previously she had begun to find her strength and appetite failing; she was at times sick after meals, sometimes vomiting; she suffered at the same time pains in the shoulders and back, which were worse at night. Three weeks before applying for advice she had felt some difficulty in swallowing, and at the same time began to lose her voice. This increased slowly until she was not able to raise her voice above a whisper; she became at the same time troubled with a constant cough; she was admitted to the hospital upon the 29th of April. Within a week after her admission the peculiar hard swollen state of the integument had extended round from the anterior and lateral region of the neck to the back of the neck and shoulders—where its characters were very marked—the affected integument felt brawny, like the skin of the swine; it could not be pinched up. At this time the colour was perfectly natural, but it subsequently became of a yellowish tinge; no pressure would make it pit. The treatment adopted upon the patient's admission to hospital consisted of small doses of Grey and Dover's powder internally, and the *Lin. Hyd. Camph.* externally, rubbed over the whole of the affected skin once a day. Within a week the voice had become nearly natural, and the patient declared herself much better. A note taken upon the 8th of May, states that 'an improvement has taken place in all the symptoms; the hoarseness has nearly altogether disappeared, and the peculiar drawn expression of the countenance does not exist to the same degree; the patient no longer complains of tightness of the throat.' The skin over front and sides of the neck, which had been chiefly affected, gradually became softer and more natural, and could be pinched up, but at the same time the back of the neck which, when the patient was admitted, was free, remained markedly affected, and the whole skin over both shoulders and scapulæ, and over the deltoid region on both sides; the induration gradually decreased down the arm, until at the elbow the integument felt natural, but upon the back of the right forearm, a patch of skin about the size of a crown piece was indurated in the same way as the rest of the diseased integument. When the arm on either side is moved up and down, the movements of the scapulæ are not seen as usual beneath the skin; they are, as it were, concealed by the thick integument, and when the hand is laid on the part and the scapulæ moved, this became very evident to the touch. No improvement took place in the state of the skin over the back and shoulders before the patient left hospital, but the face became less drawn in its expression, and at the same time got a furfuraceous look, the cuticle coming off in small heavy scales. She left hospital upon the 29th of May, and returned to her employment of book-folding. There was not at any time any inflammatory or feverish symptoms whatever. The sensibility of the affected skin was tested upon different occasions; it was diminished, but not very much so in any part. The lower part of the body remained quite free from the disease. The urine was free from albumen, and the menstrual functions were healthy."

"The natural course of this disease," Dr. Barton remarks, "appears to be, slowly to extend for some months from the point where it begins (usually the neck), and slowly to subside and disappear. The subsidence begins, as we

might expect, in the part first affected, and the improvement extends very gradually to the parts subsequently affected. In several of the continental cases, the patients have been kept under observation for years, and a gradual improvement, and finally a disappearance of the disease took place without any treatment beyond that adopted at first, and which was not very active. The rapidity with which the symptoms have appeared and progressed varies considerably; in most cases two or three weeks elapsed before the disease was decidedly established, and then as many months before any subsidence took place; in some, years elapsed without any decided change; in one of Dr. M'Donnell's cases the disease had existed a year, and the patient remained under treatment for more than a month without any improvement whatever. In one case only has an opportunity of examining the pathological anatomy of this affection been afforded. Forster, who made the examination, thus sums up his observations: 'The scleroma of this case was characterized by a chronic process of proliferation in the connective tissue of the corion, and particularly of the subcutaneous tissue, unattended with fever or local inflammatory symptoms;' the fat usually present beneath the skin had completely vanished, being replaced by the hypertrophied connective tissue. The treatment hitherto adopted, although including a great variety of local applications and internal remedies, has not seemed to make any change whatever in the disease."

32. *Discussion on Vaccination.*—The Imperial Academy of Medicine has been engaged in a protracted and exhaustive discussion regarding vaccination. The editor of *L'Union Médicale* (Jeudi, 9 Sept. 1869) gives, in the following propositions, the practical results of this elaborate debate.

1. That the degeneration of the Jennerian vaccine has not been proved.
2. That there does not exist a single authentic case of vaccinal syphilis, properly so called.
3. That the rare—very rare cases of syphilis inoculated by vaccination are explained by conditions which completely exonerate the vaccine from all influence therein.
4. That a great number of cases of pretended syphilis occurring after vaccination are exceedingly doubtful.
5. That animal vaccination, as a source of vaccination, may be encouraged, although it does not possess any real and sensible advantage over vaccination from arm to arm.

33. *New Uses of the Hypodermic Syringe.*—At a meeting of the Society of Physicians in Vienna, June 5, 1868, Dr. MADER spoke of the usefulness of this instrument for drawing out liquids for diagnostic and other purposes. *Allgem. Med. Central Zeitung*, No. 50, 1868.

He has made use of it for the purpose of obtaining blood for examination from cholera patients, and in making a diagnosis in a case of ascites, in which a doubt existed whether chronic peritonitis or cirrhosis hepatis caused the dropsy. The character of the liquid proved it to be a case of cirrhosis. In another case, an abscess in the region of the shoulder, with secondary venous congestion, was emptied with the instrument. He also pumped out a chronic serous exudation from the pericardial sac of an aged female: the first operation yielded a few ounces of liquid, and relieved the urgent symptoms; at a second trial, three ounces were removed. The patient died soon afterwards, as she had also hydrothorax. Mader thinks that the operation deserves much regard, as it is easily performed, and attended with comparatively little danger. Autopsy revealed the two spots of puncture in the pericardium cicatrized; they had produced no injurious consequences. In future operations the canula should be provided with a stopcock, so that air may not enter when the body of the syringe is detached in order to empty it; and the body of the syringe might be made of greater capacity.

He furthermore used a similar syringe for the operation of transfusion, and

¹ Guy's Hosp. Rep., vol. xiii. p. 313.

performed this by plunging the sharp canula into a vein turgesced by pressure; superficial veins were chosen. In order to avoid throwing the blood into the cellular tissue, he recommends that a few drops from the vein be first allowed to escape from the detached canula; when this has taken place we may be sure that the vein has been entered, and we then attach the body of the syringe and gently throw in the blood, or other liquid used for transfusion. He injects at several spots until enough has been entered, and says that patients submit to repeated punctures much more willingly than to the operation of laying bare the vein selected, and then opening it for the application of the syringe, which not only appears more formidable to them, but may be followed by phlebitis.—*Edinburgh Medical Journal*, November, 1869.

34. *Heat Apoplexy treated by Large Doses of Quinia.*—Mr. W. K. WALLER directs attention (*India Medical Gazette*, July 1, 1869) to the remarkably successful treatment of heat apoplexy by quinia. In India the mortality from heat apoplexy is more than 50 per cent., while by the treatment by quinia the success so far has been constant. The quinia is to be given in large doses by the mouth, or hypodermically if the patient is unable to swallow. "Probably," Mr. W. says, "the hypodermic method may prove to be the best and most convenient means in all cases, it is at least applicable to all in *any* stage.

"I am enabled, through the kindness of my friend Dr. Hall, R. A., to give a case of recent occurrence in which its success was most marked. The precise means of supplying the remedy will appear from the cases cited. I have as yet said nothing of cold affusions. I use it in almost all cases where there is great heat of surface; that it is not absolutely necessary is seen from Dr. Hall's case, and another which I shall give from my own experience. In cases of the cardiac variety, with cool and moist skin, it is of course inadmissible. Cold affusion is a valuable aid, but the remedy pure and simple is *quinia*. I give two cases of cerebro-spinal form:—

"H. B., gunner of the *Golconda*, admitted into the P. & O. Hospital at half past six P. M.

"26th May, 1866.—He had fallen from his seat whilst at tea. The surgeon who was called to see him applied ice to the head, leeches to the nape of the neck, and gave a powerful purgative, which took no effect. I saw the man almost directly after admission. He was speechless, his skin burning hot, pulse running, hardly to be counted; he could still swallow. I gave him $\mathfrak{ij}$ of quinine at once, and ordered 10 grains to be repeated every hour till he spoke. I considered him a most unpromising case; after the second 10 grain dose he spoke; nevertheless my apothecary continued the quinia, so that, by the time I paid my early morning visit, the man had taken 70 grains. He was then cool, sensible, able to sit up or even walk about, could speak, and complained of headache; the quinia was continued in five grain doses, at gradually increasing intervals, and the man was discharged on the 9th of June to his duty. The *Golconda* sailed for Suez that morning, the man had been kept in hospital, though well some days before, as a matter of precaution on account of the great heat. For the following case I am indebted to Dr. Hall, R. A., whose notes I abbreviate:—

"T. B. Driver, R. A., being in the hospital for ague, and being treated for this disorder by cinchona, was attacked at 5.30 P. M. on the evening of May 15th, with heat apoplexy. Dr. Hall found him perfectly comatose, pupils rather dilated (a sign of approaching death), skin burning hot, pulse full, 134, convulsive movements of arms and legs, grinding of the teeth, and gurgling in the throat. Three grains of quinia were at once injected under the skin near the deltoid, one and a half grain into each arm; in half an hour the convulsive movements were less, and he seemed better. In an hour he was able to swallow, and had 10 grains quinia given in water. At 8 P. M. he had ten grains more, the convulsive movements had then ceased, pulse about the same. At 10 P. M. 10 grains more. He was then conscious, and said he felt better. At 1 A. M. he was sleeping quietly. On the 17th, says he feels all right, has no headache; is to have five grains of quinia three times daily.

"27th.—Up to date no bad symptom, no return of ague, is quite well, and discharged to light duty.

"Now, both these cases are remarkable, because in them the quinia was the only remedy used. In both cold water was very partially employed, but in no such manner as could be classed as cold affusions. Quinia and that only saved these men. The three grains hypodermically injected may be taken to represent 12 grains given by the mouth.

"I will now briefly give two cases of the cardiac form of insolation, in which the remedy was equally successful.

"In March, 1856, the 2d officer of my ship *Nubia* went on shore at Galle with the captain to take sights by means of the artificial horizon. He was on shore about two hours, exposed to the early morning sun with a small cloth cap only as a head-dress. Returning on board, he went to his cabin, and sent for me. He complained of intense headache and inability to sit up or stand, his pulse was slow and laboured, his skin cold and clammy, he was very pale. I gave him 10 grains of quinia at once, and repeated the dose in two hours. He was quite relieved by the afternoon.

"Again, an artilleryman marched with his comrades from the artillery station at the Mount into Madras for embarkation on board the *Nubia* in January, 1858. The march took place between 3 P. M., and sunset. The men were all in thick cloth clothing and forage caps. This man was brought to me at once on coming on board. His symptoms were identical with those given above. He had two ten grain doses of quinia at an interval of two hours, and was well the following morning."

Mr. W. gives a table of 31 cases, 28 of which were treated by quinia and recovered; the three fatal cases were not so treated. The following cases are communicated to the same journal by other practitioners:—

Case communicated by Surgeon G. H. Daly, Officiating Garrison Surgeon.
—Private F., 26th Foot, admitted into the receiving room garrison dispensary, 10.30 A. M., on 15th June with heat apoplexy, the symptoms of which were first observed by his comrade.

At 11 A. M., when seen by me, the following symptoms were present: Very stertorous and heavy breathing, without puffing, unconsciousness, intense heat and dryness of head and body generally, bounding pulse, convulsive movements of limbs, dilated pupil.

Twenty grains of quinia were given in solution at once, ice was applied to the head, and iced water splashed over his chest and face at intervals of a few seconds; to have ten grains of quinia every hour. At noon his bowels had acted freely from an enema given on admission; he was now conscious to the application of cold water to his chest and face, starting up at every splash, but he was delirious, and unable to articulate.

At 1 P. M., breathing heavily but less laboriously, skin burning hot and dry, pulse full and strong, 120, semi-conscious, answers when loudly spoken to; ordered the body to be sponged with diluted acetic acid.

At 4 P. M., had taken 40 grains of quinia, is now conscious and answers coherently, complains of frontal headache, skin hot but moist, pulse quick but less full.

At 5.30 P. M., he was so much improved that he was sent to the general hospital.

Assistant Surgeon Carpenter, 26th Foot, was good enough to communicate his state to me on the following morning: "Slept half the night through, skin, pupils, &c., natural, tongue furred, pulse 94, compressible, complains only of dizziness when he sits up." No relapse occurred, and strength gradually returned.

Abstract of two cases of Heat Apoplexy treated with Quinia, by Assistant Surgeon E. O'Sullivan, 9th Regiment.—Since the early part of May last up to the present date, four cases of heat apoplexy occurred amongst the men of H. M.'s 96th Regiment, stationed at Dum-Dum.

The two first cases were treated in the usual way: cold applications to head, leeches, &c.; both the cases were fatal.

Cases treated with Quinia.—No. 1, S. R., Private, 69th Regiment, brought

to hospital at 6 P. M., 10th of June, from the Main Guard, where he had been confined for a couple of hours; had been made a prisoner of in the bazaar, where he was found drinking; he was in a semi-comatose state, and spoke with difficulty when aroused, complaining of pain in his head.

6.40 P. M.—Perfectly comatose, pupils dilated; skin hot; pulse full, 130; can swallow with difficulty; 10 grains of quinia given at once, to be repeated every second hour. A solution of five grains of quinia was made and at 7.30 P. M. one half of this solution was injected into the right arm at insertion of the deltoid muscle, the other half was injected into the left arm, to be repeated every hour.

In this manner he had fifteen grains of quinia, and twenty grains by the mouth, and at 10.30 P. M., the patient was conscious.

11 P. M.—Can speak; had some lime juice and water.

12 P. M.—Dropped into a sound sleep.

11th June.—Feels slight headache, otherwise pretty well.

22d June.—Quite well.

No. 2, D. S., Private, 96th Regiment, was on sentry at the hospital. About 5 P. M., 13th June, he suddenly left his post, and rushed in the direction of the hospital guard room, where he was arrested, and brought into hospital.

6.30 P. M.—Quite insensible; nearly outrageous, requiring three or four men to keep him in bed; pupils very much dilated; extreme sensitiveness of the body; eyelids open; muscular spasms frequent, and very powerful, with grinding of the teeth; pulse small, 140; skin cool and dry; unable to swallow. A solution of quinia, same strength as in the case No. 1, was immediately injected, $2\frac{1}{2}$ grains into each arm; this was repeated in half an hour.

7.15 P. M.—Spasms completely disappeared, lying quietly; cannot swallow. The injections of quinia to be repeated every hour.

10.30 P. M.—Patient slightly sensible, but upon being roused, falls into a heavy stupor.

11 P. M.—Complains of great pain in his head, and extreme thirst; had some lime-juice and water.

In this case, there were twenty-five grains of quinia injected.

14th June.—Much better; pain in head still continues; ordered leeches, calomel, and antimonial powder.

15th.—Has hæmaturia, urine being ammoniacal.

22d.—Doing very well; can walk about the ward.

Both of these cases, previous to my arrival at the hospital had cold applications to head, cathartic enemata, and leeches administered, but I am of opinion that the cure is due to the quinia.

Case communicated by Dr. Waller.—J. S. Steward, admitted 16th June, 3.30 P. M., had been working in the sun with a thin straw hat on; on leaving the deck to go below fell senseless to the bottom of the ladder. On admission, was comatose, struggling, clenching his fists, and biting his lips, respiration embarrassed, pupils contracted, skin burning hot.

Cold douche was applied and ten grains of quinia given by the mouth, and repeated hourly for three doses.

On the following morning he was sensible, cool, with a good pulse, but hesitated in his speech, which was not a natural condition. He complained of headache. A large mustard poultice was applied to the nape of the neck, and quinia in five grain doses given. On the 18th he was free from pain and stammering, and was discharged on the 19th.

35. *Hæmoptysis arrested by Hypodermic Injection of Ergot.*—Dr. DRASCHE has successfully treated two cases of hæmoptysis by the hypodermic injection of two grains of the extract of ergot in twelve grains of distilled water. The hemorrhage was arrested almost instantaneously.—*Gaz. Hebdom. de Med. et de Chirurg.*, Sept. 17, 1869, from *Bericht. d. Krankenanstalt: Rudolph-Stiftung. f. 1867*, and *Gaz. Med. Ital. Lombard*, No. 25, 1869.

36. *Bromide of Potassium in Epilepsy.*—Mr. D. M'GREGOR, late Medical Superintendent, Barnhill Hospital and Asylum, Glasgow, states (*Ed. Med. Journ.*, Oct. 1869): "I have never yet been able to cure a single case of epi-

lepsy by this drug; yet I have found it a most valuable agent in its mitigation and relief. Nay, I have in several instances kept the disease quite under control while its administration was continued. But however long this might have been done, on its withdrawal, or soon after, the dread disease reappeared, not with such violence at first, but increasing in severity as the time from the discontinuance of the bromide increased. The dose in which I usually prescribe it is a scruple three times a day to begin with. This I increase, if need be, by increasing the number of times a day in which it is given, till, in some very bad cases, a scruple is administered every two hours. Except in two cases, I do not remember of having seen bad effects from it. In these a papular rash appeared on the face, with heat and itchiness, more particularly on the nose; and in one case diarrhœa was caused by it. The first two cases in which I noticed marked beneficial effects from its use were a female inmate of the asylum, aged about forty, suffering from delusional insanity, with severe epilepsy; and in a young woman of eighteen, not insane, but becoming silly and demented by the violence and frequency of her fits. In both cases, the fits were very severe, occurring in the girl one to six times almost every day for some time before coming under treatment, and in the woman two or three times a day, but only periodically, lasting about a week at a time, generally at the monthly periods. The effect of the bromide on the young woman was distinctly noticed a few days after its exhibition. The fits became more seldom, and when they did come they were not so severe, lapsing soon into mere nervous tremors and confusion of intellect, with giddiness in the head, instead of convulsions and unconsciousness. Ultimately they ceased altogether, on a scruple dose thrice daily. The medicine was continued a couple of weeks further, while the patient improved in health and strength. In order to ascertain now the effect of stopping the medicine, it was discontinued; but in a few days the fits began to appear again, at first with slight tremors, then transitory moments of unconsciousness, with little or no spasm, but gradually becoming worse and worse until the bromide was again resumed. To make sure that this was not due to circumstances independent of the drug, such as a periodic character of the fits, the recurrence of the monthly illness, or errors of diet, etc., I had the patient kept a long time in hospital under observation, while the drug was administered for periods varying in duration, with the avowed object of baffling any accidental circumstance that might be supposed to influence the fits other than the bromide. The most rigid attempts to deprive the bromide of the credit due to it quite failed, and it was acknowledged on all hands as completely holding the disease in abeyance when regularly taken. The patient herself was so convinced of this, that she begged to be allowed its continuance, when I purposely withheld it as an experiment. Ultimately, I continued it for many months; but between severe attacks of diarrhœa, necessitating now and again its discontinuance, and the fits which would immediately take advantage of its withdrawal, and debility, the poor patient, Grace Edgar, gradually sank. In the case of the other woman referred to, I was never able to stop the fits entirely, but it was distinctly proved that they were much less severe, and instead of lasting a week at a time, they generally ceased in from one to three days.

"For some time back two men, epileptic inmates of the asylum, have been on the bromide. One of them, before beginning the medicine, seldom passed a day without a fit, and often had half-a-dozen in the day. The other had them only about once a week, nearly always in the night-time, having several during the same night. Both men, now, will not rest satisfied without the bromide, and seldom have a fit if the medicine be regularly administered. But on withdrawing it lately, it was evident that the mischief was not removed in either case, so it is again resumed in an increased dose."

37. *Therapeutic Value of the Sulphites in Zymotic Diseases.*—The researches of Prof. Polli on the antiseptic powers of the sulphites have led many practitioners to believe that in these salts we possess a most valuable remedy for the treatment of the whole class of zymotic diseases. Dr. J. W. MILLER remarks (*Ed. Med. Journ.*, Sept. 1869): "These high expectations have not, however, been fully realized in actual practice, and I have thought that it would be not

without profit to communicate the issue of a pretty full trial which, when physician to the hospital here, I gave to the sulphites in the treatment of typhus fever.

"During the year from June, 1865, to June, 1866, there were admitted into the hospital 884 cases of typhus. Of these, 161 were treated by the sulphites; sulphite of soda in most of the cases, and latterly sulphite of magnesia. The quantity administered varied from 60 to 240 grains a day—the most usual quantity for adults being from 120 to 180 grains a day."

Dr. M. gives tables, showing the age, sex, &c., of the patients treated with and without sulphites; from which it appears that the mortality in the former was 1 in 10, and of the latter 1 in 10.3.

"The sulphite seems, therefore," he observes, "to have produced no effect whatever upon the issue of the cases either favourable or the reverse. Neither, during the progress of those cases which recovered under its employment, was there any amelioration perceptible in the concomitant symptoms and complications; nor, in those cases in which the range of temperature was regularly noted by means of the thermometer, was any effect observable, either as regards the degree of elevation of temperature, or the period of the case at which the defervescence was complete.

"Lest it may be surmised that in the sixteen fatal cases the employment of the remedy was not commenced sufficiently early, I may state that in eight of them its administration was begun on or before the sixth day (in 1 so early as the third day; in 2 on the fourth day; in 1 on the fifth day; and in 4 on the sixth day).

"In addition to these hospital cases, I have tried the sulphite in several cases in private practice, with the same absence of effect. Two of these cases ended fatally, in one of which the sulphite of magnesia was given in half-drachm doses every four hours so early as the third day; in the other, it was not commenced till the sixth day.

"In a considerable number of cases, especially among the females, the sulphite induced diarrhœa. This inconvenience would be easily obviated, however, were its administration of importance, by combining with each dose a few grains of compound ipecacuanha powder. Sometimes also, but not so frequently, the sulphite provoked vomiting.

"If the sulphites possess any curative power whatever when administered after the full development of typhus fever, some manifest difference should have been observable in the course and result of the 161 cases in which they were employed, as compared with the remaining 723; and although the number of cases treated by the sulphites is not very large, I think that the facts elicited are abundantly sufficient to prove the uselessness of annoying such patients with the disagreeable draught, for the taste is sufficiently nauseous."

"There remains, however," Dr. Miller observes, "a class of diseases in which, I believe, they have been proved to possess great value—I mean, cases of purulent infection, or septicæmia. In midwifery practice, for instance, such cases are common enough. We have cases of abortion, in which the ovum is imperfectly expelled, and in which portions of the placenta are left adherent to the uterus, which shortly become putrid. In such cases the most serious consequences frequently ensue from the absorption into the blood of the putrescent material. In cases of adherent placenta, likewise, at the full term, the same peril is present. Under such circumstances we possess, I believe, in the sulphites a very effectual means of reducing the danger to a minimum. I have had several such opportunities in practice of testing the power of the sulphites, and with the most satisfactory results. One very marked case occurred to me within the last few weeks. After a very protracted and difficult case of labour, in which the child was hydrocephalic, the head requiring to be opened before delivery was effected, the placenta was found to be adherent. It required to be scraped from the uterus over its whole extent by the fingers, and doubtless numerous small fragments were unavoidably left here and there adherent, as was partly proved by the occurrence, a few days later, of considerable hemorrhage, which was arrested by means of ergot. The woman lost much blood before the extraction of the placenta, was much exhausted by the long labour,

and the uterus contracted very imperfectly. The discharges soon became putrid, and the patient was just in the condition to favour the absorption of the putrescent fluids by the uterine vessels. I put her at once under treatment by half-drachm doses of the sulphite of magnesia every fourth hour. For a few days she was in a high fever, but nevertheless she made a rapid and complete recovery, and was able to walk out of doors within three weeks after her delivery. Several other similar cases have occurred to me, to give the details of which, however, would be of little use. They were either cases of delivery at the full time, in which, from retention in the uterus of coagula of blood, or of fragments of the placenta, the lochia became putrid; or cases of abortion, in which the placenta came away piecemeal, and in which, under the employment of the sulphite of magnesia, the constitutional symptoms were either slight or entirely absent. To be of any avail, I believe the remedy must be given in considerable doses, from half a drachm to a drachm every fourth or sixth hour, and, still more, that its use must be commenced early in the case, either before or immediately on the appearance of the constitutional symptoms. In one case of abortion in which the sulphite was not given until after the development of symptoms of blood-poisoning, it had not the slightest effect in mitigating the course of the disease, and the case ended fatally."

38. *Treatment of Hyperidrosis by Sage.*—VAN SWIETEN used sage with good success in the treatment of hypercrinia sudorale; Dr. VIGNARD profited by this plan in the following case: A man 25 years of age, strong and healthy, was for many years from time to time the subject of abundant sweating, which came on at two or three o'clock in the morning, without any appreciable cause. The secretion was so abundant that the mattress on which he lay was soaked completely, and it was general over the whole body. Sulphate of quinia not having proved of any service, Vignard prescribed the following decoction: Leaves of sage a handful, water half pint. These are made to boil for about two minutes; they are then left to get cool together; the fluid is strained and sweetened to taste. It is taken in the evening. The sweating ceased from the first day of the use of the decoction, but reappeared with the suspension of the treatment. From this good result Vignard advises the use of sage for the treatment of the sweating in phthisical patients, which to the present time there has been found no method of checking. On account of the fugitive character of the effects, it is necessary to keep the patient under the influence of the remedy as long as we desire to prevent the return of the disease. The efficacy of the decoction of sage is increased by the addition of alum and of diluted sulphuric acid.—*Ed. Med. Journ.*, Nov. 1869.

SPECIAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

39. *Fusiform and Tubular Aneurism of the Subclavian Artery, and the Treatment by Compression.*—Mr. ALFRED POLAND read a paper on this subject before the Royal Med. and Chirurg. Soc. (June 8, 1869), the main object of which was to offer some remarks upon subclavian aneurism and wounds and lesions of the subclavian artery, as suggested by an interesting case coming under the author's notice and care at Guy's Hospital. The patient was a man, aged 44, a bricklayer's labourer, who was admitted into Guy's Hospital on October 7, 1868. He had formerly been employed in the gas works, and latterly had been in the habit of carrying a hod of bricks upon his shoulder. For the last two years he had suffered from occasional pain in the right arm, which gradually increased. He attributed this to an injury to the fingers which he had received about that time. During the last month the pain had become so severe that he was forced to give up work. On applying for advice to Dr. David Johnson, of the Old Kent-road, there was discovered for the first time a pul-

sating tumour above the right clavicle. It was considered to be aneurismal, and the patient was recommended to apply for admission into the hospital. The patient, on admission, appeared to be fairly nourished, although naturally thin, and his general health was good. His expression was somewhat anxious. In the supra-clavicular region on the right side there was a pulsating tumour, fusiform in shape, passing downwards and outwards, and meeting the clavicle at an angle of forty-five degrees. It was more than one inch in length, and nearly half an inch in breadth at its widest part, and was very much like a large filbert. Above it diminished gradually to the size of a large goose-quill, and after remaining for a quarter of an inch of that size it seemed to curve downwards and inwards, becoming lost under the muscles. The lower or distal end did not seem to diminish so rapidly, and the pulsations of the artery could be felt between the tumour and the clavicle, as also very distinctly below that bone. The tumour was almost subcutaneous, and the pulsations in it very strong; and the expansion, which was uniform, was considerable during each beat. By pressure on the artery above the tumour, the pulsation in the latter was readily stopped, and the swelling became quite soft and flaccid, and easily emptied, so that it almost entirely disappeared. No pulsation could be felt in the radial or ulnar arteries, nor in any artery of the right arm as far up as the axillary to within a short distance below the clavicle. There was no other tumour or swelling in any part of the course of the vessels, and the axilla was quite free from any induration or glandular enlargement. The right arm was weak, but he could perform easy motion with it. The circumference of the limb, both over the biceps and in the forearm, was less than that of the opposite side. There was also evidence of deficient nutrition in the nails of the fingers of the right hand, which were ill-developed and desquamating. He complained of pain down the radial border of the forearm and in the index finger, and occasionally this pain extended upwards to the acromial process. There was numbness in the fingers and hand generally, but there did not seem to be any impairment of actual sensation. The arm was always cold, and had to be wrapped up in flannels. There was no cedema, and no obstruction in the venous system. It was found that, in consequence of the high position of the first rib in the neck and the comparatively superficial abnormal course of the artery, pressure on the vessel could be made without trouble and without causing pain. Consequently it was agreed to make digital pressure on the cardiac side of the tumour, in the hope of effecting a cure. This was accordingly carried out almost uninterruptedly for ninety-six hours, and then discontinued, in consequence of the discoloration and tenderness of the skin at the site of pressure, and unwillingness on the part of the patient to undergo any further treatment. The tumour, however, had become undoubtedly much smaller and harder, but still pulsated, although this pulsation could be controlled by the merest pressure. The man left the Hospital, and in the course of a month showed himself again, when the tumour had lost all sensation, had become hard and somewhat smaller. This patient attended at Dr. Johnson's residence regularly for several months, and was carefully watched by him. The tumour gradually disappeared, and the whole track of the artery seemed converted into a fibrous cord; but there could be traced a very large artery running transversely across the posterior triangle of the neck immediately above the site of the former tumour. It seemed to emerge from under the sterno-mastoid muscle, and was lost under the trapezius. The author drew attention to the following conditions, and these were illustrated by references to cases and quotations from well-known writers on aneurism: 1. The remarkable deviation from the normal course of the right subclavian artery in the third part of its course. 2. The peculiar character of the aneurism, as being of the fusiform or tubular variety of aneurism by dilatation, and where all the coats are uniformly distended. 3. The treatment adapted—viz., indirect digital compression on the cardiac side of the aneurism, leading to a successful issue. The paper is accompanied with the details of three unpublished cases of subclavian aneurism. 1. A case of subclavian aneurism cured by direct pressure, by Mr. F. M. Corner, Surgeon to the Poplar Hospital. 2. Notes of a case of subclavian aneurism for which amputation at the shoulder-joint was performed with suc-

cess, by Professor Spence, of Edinburgh. 3. A case of aneurism by dilatation of the subclavian artery, by Dr. Robert Adams, of Dublin, with some further notes on Mr. O'Reilly's case of ligature of the subclavian artery for subclavian aneurism. The paper concludes with an elaborate statistical analysis of 115 cases of subclavian aneurism, of which the following table gives a general summary of the cases. These are arranged according to the treatment pursued. The cases are placed under one heading only—viz., under the treatment last adopted, although many of them had previously been subjected to one of the other forms.

Summary of Cases according to Treatment.

	Successful.	Died.	Total.
Cases in which no particular treatment was adopted, and specimens undescribed, and not having been the subject of any operation	3 cases 4 unknown	24 deaths 5 specimens	36
Medical and Valsalva treatment	7	4	11
Hypodermic injection	1 relieved	...	1
Compression	4	...	4
Injection into sac	1	2	3
Acupressure	...	1	1
Manipulation	2	2	4
Galvano-puncture	1	...	1
Attempt at operation	1	6	7
Ligature of third portion of subclavian	6	10	16
Ligature of first portion	...	9	9
Ligature of carotid	...	1	1
Ligature of innominate	...	12	12
Ligature of innominate, and carotid, and vertebral	1	...	1
Ligature of first portion of subclavian and carotid	...	2	2
Ligature of subclavian, carotid, and vertebral	...	1	1
Distal or Brasdor's operation, ligature of axillary	...	4	4
Amputation at shoulder-joint	1	...	1
Total	33	—	—

Med. Times and Gaz., August 28th, 1869.

40. *Temporal Deligation of the Abdominal Aorta.*—Dr. WILLIAM STOKES performed this operation in a man æt. 50, who had a large pulsating tumour occupying the right ilio-femoral region. Pressure was attended with very severe pain; and the idea of using it was abandoned. The chief difficulty in the operation attended the separation of the peritoneum from the transversalis fascia. The aorta having been exposed, Mr. Stokes "passed a Lühr's aneurism needle around the aorta, just above its bifurcation, and attached to the ligature a piece of silver wire, which was then drawn round the vessel. The ends of this were then passed through Mr. Porter's artery-compressor, and traction was made on them until all pulsation and *bruit* had perfectly ceased in the tumour. The ends of the wire were then secured to the ring of the clamp." The wound was now closed. "The operation was almost bloodless." Afterwards, restlessness, pain, and sensation of heat, were the chief symptoms. The operation was concluded at 11.15 A.M. At 2.30 P.M., it is noted: "The temperature in the left lower extremity is very good; that in the right has greatly improved. At 9 P.M., pulsation in the left femoral artery had returned. At 10.30 P.M., the patient became unconscious; and at 12 (midnight), he died—about twelve hours after the operation. On removing the wire-compressor and slitting up the artery, its coats were found not to have received the slightest injury. Mr. Stokes, in summing up, calls attention to the following facts: 1. Occlusion of so large a vessel without injury to its coats; 2. Early re-establishment of collateral circulation; 3. Rapid consolidation of contents of aneurism after the operation; 4. Death due to a shock in a person with fatty heart; 5. The non-liability to gangrene, owing to re-establishment of collateral circulation, and the power of removing the compression at any time. Finally, a table of the previous cases is given. The full details of this case will be found in the *Dublin Quarterly Journal of Med Sci.* for Aug. 1869.

41. *Femoral Aneurism: Ligature of External Iliac Artery: Recovery.*—Dr. R. T. LAND, of Leeds, read before Surgical Section of British Medical Association, a case of aneurism of the right femoral artery in a woman *æt.* 33, a weaver. "About six or seven weeks before my seeing her, the patient had much heavier pieces of cloth to lift than usual; this was followed by a weak, numb feeling in the right leg, and a difficulty in standing, to such an extent that she was compelled to give up work. At this time, she noticed, in the upper part of the thigh, a lump, which gradually increased in size, and to relieve the pain of which she had recourse to frequent rubbing with the hand. There was now unmistakably distinct aneurism of the femoral artery. The skin covering it was of a bluish-white colour, glazed, and very tense, and presented all the appearance of giving way externally. In conjunction with my father and my friend Mr. Jessop, it was determined to ligature the external iliac artery. This was accordingly done, under chloroform, on November 24th, 1868. Nothing unusual occurred in the course of the operation, until, after carefully dividing the various strata of the abdominal wall, it became a question whether the structure exposed was peritoneum or simply transversalis fascia. The opinion seemed to be, that the lining membrane of the abdomen had yet not been exposed, and that the structure was transversalis fascia. This was therefore slit up to the full extent of the external wound, when it was at once discovered that the peritoneal cavity was opened. The cut edges were held together by Mr. Jessop; and, without anything further untoward taking place, the operation was completed. All went on well until December 4th, when, from the patient having had a restless night or two, and considerable pain in the right hip, on which she was lying, I was induced to examine that part, and found a very large sloughing bed sore, which had been considerably aggravated by the patient persistently urinating into the bed, and which, unknown to me, had existed before the operation. With the view to get over this second complication, I now had the patient placed on a water-bed, and the sore dressed, in the first instance, with carbolic acid lotion, and afterwards with zinc ointment, until it was completely healed. Means were adapted to keep up and improve the general condition of the patient; and all went on satisfactorily, with the exception of one or two points, to a complete and satisfactory recovery. The ligature came away, with a little assistance, on December 31st, the thirty-eighth day."—*Brit. Med. Journal*, Nov. 27, 1869.

42. *Mixed Treatment for Popliteal Aneurism.*—M. DESGRANGES (of Lyons) communicated to the Imperial Academy of Surgery (Oct. 6, 1869) a very interesting case of popliteal aneurism treated successfully by the employment of several methods: digital compression, mechanical compression, flexion, and refrigeration. M. D. recommends this mixed treatment, which perfectly succeeded in this case, the subject of which was a physician.—*L'Union Médicale*, Oct. 16, 1869.

43. *Hypodermic Injections of Ergotine in Aneurisms.*—LANGENBECK reports (*Berl. Klin. Wochensch.*, vi. 12, 1869) two cases of this.

The first was that of a man *æt.* 45, with a pulsating tumour in the neck, the size of a fist, and the pulsations in which greatly annoyed the patient. On the 6th of January, 1869, Prof. L. made a first subcutaneous injection of 0.03 gr. watery extract of ergot, on a level with the aneurism. After this the pulsations became weaker and the tumour diminished in size. Between the 6th of January and the 17th of February there was injected at regular intervals of about three days two grammes of ergotine in doses, varying from 0.03 to 0.18 grammes (half a grain to three grains). The tumour was notably diminished in size, and the pulsations were less strong.

The second case was that of a man *æt.* 42, who had had for twenty years a pulsating tumour of the radial artery, of the size of a hazel-nut, three centimetres from the hand. Prof. L. injected 0.15 gr. of ergotine between the skin and the tumour; the next day the aneurism could not be detected. It reappeared momentarily in consequence of a slight effort made by the patient, but it had completely disappeared at the end of eight days.

The editors of the *Archives Générales* (November, 1869), from which journal we condense the above account, justly remark that these results seem to be very extraordinary, and to have been obtained very promptly, but certain aneurisms are so refractory to every species of medication that it is well to notice every measure which has any appearance of success.

44. *Polypus of the Ventricle of the Larynx; Ablation after Division of the Laryngeal Cartilages; Cure with the Preservation of the Voice.*—Dr. KRISHABER communicated to the Imperial Society of Surgery a case of this. From the report made by MM. Guyon, Trélat, and Saint-Germain, we glean the following particulars:—

The patient had a fibrous polypus in the right ventricle, every attempt to remove which by the natural passages had entirely failed, but which was fortunately extracted by thyroid laryngotomy. The patient was cured, and his voice preserved, the tone of which was lowered, but in all other respects perfect and free. M. Guyon assured himself of this by causing the patient to sing, and by laryngoscopic examination.

The report extols the operation performed in the above case, and indorses the opinion of Dr. Krishaber that for the removal of all polypi implanted in the sinus of Morgagni, and upon the anterior parts of the vocal cords, the operation which should be selected is thyrotomy. Finally, it will be always preferable to incise at first only the thyroid cartilage and not to make a more extended incision, or a simultaneous tracheotomy, except peculiar circumstances should require it.—*L'Union Médicale*, Aug. 21, 1869.

45. *Amputation of the Right Arm at the Shoulder-Joint; with Excision of the Scapula.*—Mr. VINCENT JACKSON records (*British Medical Journal*, September 18, 1869) the following case of this:—

Samuel C., aged 35, was admitted into the Wolverhampton General Hospital in December, 1864. He was employed on the Great Western Railway as a labourer; and whilst so employed, was knocked down, being struck on the back by the buffer of an engine, the wheel of which passed over and crushed his right arm. As quickly as possible, I believe, he was conveyed to the hospital; but not before a considerable quantity of blood was lost. At half-past six in the evening, shortly after his admission, I saw the patient. He was an unusually well developed and strong man; his face was pale, but not blanched; the countenance expressive of suffering great pain. He was perfectly sensible, and anxious for something to be done to his arm. His habits were intemperate.

On a careful examination, it was ascertained that a compound comminuted fracture of the right arm and forearm existed, and also that the shoulder-blade was broken in more than one place, although the skin covering it was entire, but seemingly much contused. The chest and the other portions of the body were thoroughly examined, but no lesion was detected. A consultation of the surgical staff of the hospital was held; and it was determined to remove the limb at the shoulder-joint, and to deal with the scapula afterwards, as its condition might require. I as quickly as possible amputated the arm at the shoulder-joint; and, the vessels being secured, an examination with the finger induced me immediately to proceed to the removal of the scapula. It was extensively comminuted and the muscles around it torn, bruised, in fact, almost pulpy; yet the skin, as previously mentioned, was entire. An incision was first made from the upper part of the flap behind to a little beyond the posterior border of the shoulder-blade in a transverse direction and on a level with the spine, and another at right angles to it along the whole extent of the same border. The flaps thus marked out were dissected back, the fractured portions carefully raised from below upwards by division of the muscular attachments, the edge of the knife being kept well upon the bones; the upper and the largest fragments, consisting of the spine and supraspinous fossa, was finally detached after the acromial process had been sawn through, a portion of it being left in attachment to the clavicle. Four vessels were ligatured; the precaution being taken to tie each artery immediately it was cut. The wound was dressed, after the edges had been approximated with wire sutures, with water-dressing. The

patient was placed in bed, but he died the next morning, sinking apparently from exhaustion. The *post-mortem* examination revealed no further injuries than those detected during life.

46. *Amputation at the Ankle; Union by First Intention.*—DR. JOHN DUNCAN relates (*Ed. Med. Journ.*, Oct. 1869) the following interesting case of this:—

A railway workman, æt. 22, had his foot crushed by the passage of a wagon over it on the 2d of May. "He arrived in Edinburgh at six in the morning, when I was requested by Dr. Inglis to remove the foot. It was Sunday, and I had only silk at hand, so, after amputating by Syme's method, I ligatured five vessels. The edges of the wound were accurately and closely stitched with deep sutures, and a sponge was applied over the flap, with a little pressure to stop oozing. The sponge was removed in a few hours, and for seventeen days thereafter the stump lay untouched and unmoved. During that time there was not a drop of pus. I then removed two ligatures which hung from one side, and their apertures at once healed. Three at the other side resisted firm traction. Next day a little redness surrounded them, and for a week about ten minims of pus daily exuded. This ceased, and in the fifth week after amputation I forcibly removed two of the ligatures, and broke the third in the attempt. Slight redness followed, but disappeared under twelve hours' irrigation.

"In all, not two teaspoonfuls of pus were formed. The patient was out of bed in three weeks, and at the end of five, could put the weight of his body on the stump.

"The attention of surgeons has of late been much directed to the healing of wounds by primary union. Acupressure, for example, and the carbolic acid treatment have for their object the removal of certain impediments to the process. Whether it be better to use needles removable in twenty-four hours, or to leave a form of ligature permanently in the tissues, is yet *sub judice*; but it is of importance that we do not overlook the part which perfect rest plays in producing the successful result. It is difficult to resist the tendency to ascertain how things are going on, to make the position easier for the patient, or, in short, to meddle with other laudable but pernicious motives. Very little is hurtful friction to a wound, very little breaks down recent adhesions. One advantage of acupressure is that you have no ligatures to pull at—of catgut, that you have no needles to remove. The success of the case related was due plainly to non-interference; and I have thought it worthy of notice, because primary union is rare in the ankle-joint amputation, and because it illustrates at once the innocuousness of silk, and the hurtfulness of the necessary traction."

47. *Excision of the Hip-joint for Hip-disease.*—In a series of elaborate clinical papers in the second volume for 1869 of the *Medical Times and Gaz.*, Mr. THOMAS BRYANT discusses the subject of Hip-disease, and in the No. for October 16, he offers the following remarks on excision of the joint:—

"When dead bone can be made out to exist in a suppurating hip-joint, there can be no question about the propriety—nay, necessity—of its removal, and as it is generally in or about the head or neck of the femur, it seems tolerably certain that the best practice lies in its decapitation. When the bones entering into the formation of the hip-joint in its pelvic aspect are also involved, there seems to be no strong reason against their removal, should they be necrotic; for it is certain, as long as they remain to keep up irritation, a cure by natural processes is impossible. An operation undertaken upon the hip-joint, under these circumstances, is scarcely more than any severe operation for necrosed bone, and, in all probability, is not more dangerous. The joint as a joint has to a certainty disappeared altogether, and a free incision into it will hardly add to the dangers of the case. An operation undertaken under these conditions should be classed with those for dead bone. When the acetabulum is only superficially affected or stripped of its cartilage, there is no reason why the diseased head of the bone should not be removed; for the disease in the pelvic portion of the joint is probably secondary to that in the femur, and will undergo a natural repair as soon as the source of its disease has been removed.

When the disease in the pelvis is extensive, the operation of excision may certainly be an open question—that is, of excision of the head of the femur alone; for if the pelvic bones are necrotic or irreparably diseased, it is quite certain such an operation will be of little use. If the necrosed pelvic bones can, however, be removed (and there is no limit to the capabilities of surgery in this respect), there is no reason why the operation should not be followed by a good result; for operations for necrosis, however extensive, are, as a rule, successful, and when performed upon the disorganized hip-joint, there is no reason why they should not be attended with a like success. Extensive gouging of inflamed or so-called carious bone, whether about joints or otherwise, I always look upon with disfavour. The gouging, I am disposed to think, does as much harm as good when applied to any other than dead bone. The removal of dead bone is always a good practice, but the gouging of inflamed bone I hold to be unnecessary, if not injurious.

When the presence of dead bone cannot be made out, or evidence exists that no such complication seems to interfere with a natural recovery, it is still a disputed point amongst surgeons whether excision of the head and neck of the femur be a necessary or even justifiable operation, for those who argue against its adoption assert, and with some truth, that all these cases of hip disease are capable of a natural repair in patients who have good or even tolerable reparative powers; and that in those that have not, the operation of excision would naturally fail, for as much power is probably needed to effect a cure after excision as is demanded for the natural cure of an uncomplicated suppurating or disorganized joint.

To these latter remarks, however, I am disposed to demur. I am ready to admit—indeed, I sincerely believe—that, in all cases of disorganized hip-joints in which disease of the bone does not exist to interfere with recovery, a natural cure may fairly be looked for at no distant date, as long as the powers of the patient keep up their strength, and no signs of failure make their appearance. But when these signs show themselves in a decided way—when evidence exists that in the battle of disease the reparative processes yield to the morbid, and that treatment fails to turn the scale in their favour, it becomes an open question, which we will appeal to facts to decide, as to the expediency of performing excision, although I may at once admit that I believe the operation, under such circumstances, to be not only justifiable, but highly advisable. The removal of the source of irritation decidedly acts beneficially upon the patient, and many a case has doubtless gone on to recovery after the operation of excision that would, unoperated upon, have eventually succumbed to the disease, worn out by suppuration and exhaustive efforts of repair.

For facts in reference to excision of the hip-joint, I have gone to Hodge's work, and to a recent paper by Dr. R. R. Good, of Paris, the former author giving us a statistical table of cases up to 1861, and the latter from 1861 to 1868. Hodge gives us 111 cases, 56 of which recovered, and 55 died. Good quotes 112 cases, 52 of which recovered, and 60 died; a little more than half of the whole number of cases have thus proved fatal.

Mr. Holmes also, in his excellent work on children's diseases, gives us nineteen cases, of which, in a general way, one-third died from the operation, another third recovered with useful limbs, and the remaining third, although not recovering, derived great benefit from the operation.

On analyzing, however, these cases a little closer, and more particularly inquiring into the influence of age upon the operation, some valuable facts come out; for of 100 cases as given in Hodge's work, in which the age of the patient was reported, and in which amputation was not subsequently performed, I found the following results: Out of 46 cases operated upon under 10 years of age, 15 died, or 33 per cent.; out of 37 cases operated upon between 11 and 20 years of age, 21 died, or 57 per cent.; out of 12 cases operated upon between 21 and 30 years of age, 7 died, or 60 per cent.; out of 6 cases operated upon over 30 years of age, 5 died, or 83 per cent. The analyses of Good's cases indicate the same truths, for of cases operated upon under 12 years of age, 40.6 per cent. died; between 12 and 20 years of age, 60 per cent. died; between 20 and 58 years of age, 76 per cent. died.

In young life, therefore, in which hip-disease is usually met with, excision of the head of the femur is by no means a fatal operation, as two out of three get well; from 10 years to 30 years of age, something less than half recover, and after that period it is full of danger. Excision of the hip-joint is clearly more dangerous as age increases, and in this it is like amputation, lithotomy, or any other great operation. Children beyond infancy bear these severe measures well, and it is important that this fact should ever be before us.

It is, however, of equal importance to remember that it is in young life we meet with the best success in the treatment of disease—in hip-joint as well as in other joint affections.

Recognizing the fact, therefore, that excision of the head of the femur is not only a justifiable, but a good operation in selected cases, let us briefly consider under what circumstances it should be performed.

From the general facts as learned from statistics, two great results clearly come out:—

That in childhood this operation is attended with success, two patients out of three recovering, and

That in adult life it is attended with great danger, two out of three patients at least dying.

In the former case, consequently, the operation may be entertained under circumstances which in the latter would render it clearly unjustifiable.

With these two broad truths before us, let us enter a little into particulars in our endeavour to determine the question, When should excision of the hip be performed? And, first of all, when should it not be performed?

It should certainly never be performed in cases in which suppuration or disorganization of the joint has not taken place; for as long as this condition is kept off, by surgical as well as medical skill, a sound hope exists that a cure of the disease, although by ankylosis, may be secured. The cases I have already quoted on previous occasions clearly illustrate this fact.

It should not be performed when all evidence tends to show that the bones entering into the formation of the joint are not extensively involved, or necrotic wholly or in part, and the general condition of the patient under proper treatment is fairly maintained.

It should not be entertained for disorganization of the hip-joint as the result of synovial disease, unless it is clear that the general health of the patient is gradually yielding to the disease.

It should never be performed for acute suppurative disease.

On the other hand, it should always be entertained where it is clear that extensive bone mischief exists, or partial necrosis; for it is tolerably certain that, under such circumstances, a cure by natural processes is highly improbable.

It should always be entertained where the general health of the patient is clearly giving way under the influence of the local disease, whether that disease be in the bones or synovial membrane, or both.

I believe these general conclusions respecting excision to be based on a fair interpretation of the clinical and pathological facts which I have been able to gather upon the subject. They can only be given, however, as general guides for practice. The discussion upon the propriety of an operation in any given instance must rest invariably upon the particular facts of the individual case. The accumulated experience respecting excision which has been given to the profession is certainly enough to prove that excision of the hip is a very valuable operation under certain circumstances, and it would be a pity to bring it into disrepute by performing it in cases which are capable of a cure by natural processes."

48. *Extirpation of the Os Calcis*.—The Nos. of the *Archives Générales de Médecine* for Sept. and Oct. 1869, contain an elaborate memoir, by Prof. POLAILLON, of Paris, on this operation which was first performed by Monteggia, in 1814, but which he thinks is not sufficiently often resorted to in consequence of its value not being known. In order to determine the cases to which it is applicable, and to establish its value on a solid basis, Prof. P. has collected 65

cases of extirpation of the os calcis, which he has collated and arranged, showing the result in each case.

After giving a summary and analysis of these cases, Prof. P. considers the objections which have been urged against the operation, all of which he conceives to have no great weight, and then minutely describes the method of operating which he prefers.

The following are the conclusions at which he has arrived from his investigations:—

Extirpation of the os calcis should be a recognized operation, for it preserves a very useful foot both for standing and walking.

The success of the operation varies according to the age of the patient.

In children and adolescents it succeeds more than eight times in nine, and affords a useful limb.

In adults it fails in half the cases, and when it succeeds does not in general give as good results.

In cases of caries of the os calcis, in children and adolescents, extirpation of that bone should always be preferred to amputation. But in adults amputation is preferable to extirpation; for in them a stump generally affords a more solid and less delicate support for the purposes of a lower limb, than a foot deprived of its os calcis. It must be borne in mind, however, that the mortality after amputation is much greater than that after extirpation, and that under certain conditions the latter may effect a cure with much less peril to life.

When rest and appropriate topical applications fail, after long trial, to cure disease of the posterior portion of the foot, and the propriety of an operation is considered, the surgeon should carefully examine whether the os calcis *alone* is diseased, or whether the neighbouring parts and the tibio-tarsal articulation is implicated. If the localization of the disease is well established, the diseased bone should be extirpated.

But if the limits of the disease cannot be determined either by methodical exploration, or the attendant functional derangements, or the progress and history of the disease, the idea of extirpation should not be abandoned. Everything should be arranged as if for the performance of that operation—an exploratory incision down to the bone should be made, so that this incision may serve, according to the extent of the disease, either for the ablation of the os calcis, or for the tibio-tarsal disarticulation, or for amputation of the leg.

In cases of comminuted fracture of the os calcis by a ball or from other cause, with penetrating wound of the integument, it is probable that extirpation will be necessary, because in general osteitis results in caries. We generally wait before operating, in order to be sure that the wound of the bone will not heal by granulation.

In central caries which has not yet extended to the articular surfaces of the os calcis the operation for *complete scooping out of this bone* should be performed.

In peripheral caries with suppuration of the articulations of the os calcis, the disarticulation of the bone with rasping or cauterizing of the corresponding articular surfaces, should be resorted to. But if the astragalus, the cuboid, and scaphoid are deeply affected with caries, it is prudent to at once perform tibio-tarsal amputation. When the whole bone is necrosed, and where there is diffuse phlegmonous erysipelas, excision of the os calcis succeeds best, because the periosteum is separated by the suppuration, and the operation consists of simply extracting the sequestrum. It is also in these cases that the most complete bony reproduction takes place.

The neoplasms which may indicate extirpation of the os calcis are especially enchondromas or fibromas, almost never cancers. At their commencement cancers do not form a tumour sufficiently appreciable to be diagnosticated; later, when they have become large, they invade the neighbouring tissues, and it would not be prudent to attempt any other operation than amputation of the foot.

The existence of fistulæ, or of small ulcers, or of inflammatory induration of the heel do not contraindicate extirpation. But extensive ulceration of the skin, its alteration from the existence of a cancerous tumour, or even its extensive thinning from the development of a benignant tumour, contraindicate extir-

pation. Even supposing that a cure could be effected, the patient would be obliged to walk on a cicatricial surface, and would be exposed to all the troublesome consequences which result therefrom.

In all cases it is advantageous not to delay operating too long. The constitutional irritation resulting from extirpation of the os calcis is so trifling that the operation may be performed even on patients exhausted by long disease.

49. *Dislocation of the Shoulder downwards, or in the Subglenoid Position, with Fracture of the Neck of the Humerus, probably Extra Capsular.*—An interesting case of this was communicated to the Medical Society of London by Mr. HAYNES WALTON. The patient was a man, æt. 48, who, ten weeks before seen by Mr. W., had fallen into a drain. Fracture was at once detected and treated. A month afterwards, on removing the splints, the dislocation was recognized. The patient suffered very much pain—in fact that alone sufficed to justify the attempt at replacement. The ordinary method, however, of procedure, was out of the question on account of the recent fracture. The following plan was adopted: The whole of the limb was most carefully padded, from under the head of the humerus to the wrist; a splint a yard in length was then applied along the inner side of the limb, and another of the same dimensions on the outer side, the two being thoroughly fastened together by straps. The patient was then placed on a table, and chloroform administered to him. A broad strap was then placed across the shoulder, and carried down over the belly and the back, and attached to a cord in a line with the body. By this the scapula and clavicle were fixed, and the body was kept still. A second and narrow strap was passed under the arm, and made to rest on the head of the humerus, its extremities being attached to a cord communicating with the pulleys behind the head of the patient. Extension was made in the ordinary manner, the splints being used as a lever to direct the bone in the required position, Mr. Walton at the same time applying the required manipulations. By this plan there was “no pulling made on the bone, so that the fracture remained undisturbed, nor any lateral pressure on it, as the lever acted above it.” After three-quarters of an hour, unexpectedly, and with a distinct noise, the reduction of the dislocation was effected. A good deal of local and general disturbance followed, but at the end of three weeks, passive motion was commenced, and at the end of six weeks the arm could be used nearly as well as the other. Mr. Walton explained that during the operation no doubt numerous adhesions were broken down.—*Lancet*, Oct. 30th, 1868.

50. *Results of Paracentesis Thoracis and Tracheotomy.*—In a report made to the Medical Society of Hospitals on the diseases most prevalent in Paris during the two months of March and April, M. BESNIER has taken notice of the frequency and severity of pleurisies, and the advantage gained by the operation of paracentesis. In twenty-five cases, the operation had been performed fourteen times always with success, the patients treated in this manner having recovered more rapidly than those did in whose cases the effusions were too limited to warrant the operation. It is not only in subacute cases where the effusion is considerable that these physicians accustomed to the operation make use of it, but M. Frémy, for example, has used it in four cases of acute pleurisy with comparatively slight effusion, and in all the four has been thankful that he did so.

The success of surgery has been less when applied to the treatment of croup. We are neither for nor against tracheotomy. We believe that in desperate cases it may be of service in prolonging life, and thus either giving our art the chance of interfering with success, and the organism the opportunity of regaining sufficient strength to combat disease successfully; but we dare not advise its performance in croup in the way in which we advise paracentesis in pleurisy. The partisans of tracheotomy answer the fatal statistics of its opponents by saying, that it is used only in cases of the worst kind, in which the disease, if left to the resources of the physician, would prove certainly fatal; and that, consequently, successful cases are really *resurrections*. We do not wish to oppose this way of looking at the subject; but we must say, that during March

and April, there have been very few of these resurrections. M. Barthez, a great supporter of tracheotomy, has had thirteen cases in the two months, eleven of which have died. M. Bergeron, out of nine cases, has had three successful ones. M. Roger has lost all the seven cases in which he has operated; one of them, however, died from the effects of fever contracted in the hospital. —*Ed. Med. Journ.*, Nov. 1869, from *Gazette Médicale de Paris*, No. 23, 1869.

51. *Section of Nerves in Tetanus.*—On the evening of November 25th, instead of amputating, Dr. MAUNDER cut down upon and severed the ulnar, radial, and median nerves of the arm of a man who was the subject of tetanus following injury to the three inner figures. On the next day, the symptoms were aggravated, and the disease appeared to be pursuing its usual course. The patient afterwards died.—*Brit. Med. Journal*, Dec. 4, 1869.

52. *Ovariectomy twice successfully performed on the same Woman.*—Dr. W. BOINET communicated to the Imperial Academy of Medicine, Sept. 28, 1869, the case of a woman *æt.* 48 with an ovarian tumour, upon whom he performed ovariectomy on the 11th of Oct. 1868, removing the left ovary, which weighed about 18 kilogrammes (nearly 37 pounds); recovery was rapid. Ten months afterwards he operated again, removing the right ovary, which weighed 9 kilogrammes (nearly 18½ pounds); the patient recovered. The right ovary had been carefully examined at the time of the first operation, and was not observed to be enlarged, so that it had attained its present size in a very short period.—*L'Union Médicale*, Sept. 30 and Oct. 2, 1869.

53. *Ovary and Fallopian Tube included in a Crural Hernia.*—Dr. OETTINGEN (*Petersburg Med. Zeitschr.*) describes the case of a female, 32 years of age, who, fourteen days after her ninth confinement, upon lifting a heavy weight, found that a swelling about the size of a walnut had made its appearance in her left groin which was irreducible, but produced no inconvenience. At the end of nine years, for the first time, rending pains in the swelling were experienced; the latter became more tense; vomiting ensued, but the discharges by stool were not interfered with. When seen by Dr. O. the swelling was of the size of a goose's egg. At the end of ten days after strangulation had taken place, an operation was performed. The swelling was found to be caused by a crural hernia. On opening the sac it was found to contain an ovary of a dark red colour, near to which lay an intensely red coloured fold of mucous membrane, similar in appearance to the coronal of a small flower, and was unquestionably the swollen fimbriae of the mouth of the Fallopian tube. The operation of detaching and the reposition of the displaced parts was somewhat troublesome. The healing followed quickly by the first intention.—*Centralblatt. f. d. Medicin. Wissenschaft.*, Aug. 1869. No. 39. D. F. C.

54. *Stricture of the Urethra; its Prevention, Early Detection, and best Method of Treatment.*—Mr. W. F. TEEVAN, in a paper read before the Surgical Section of the British Medical Association at its meeting in July last, drew attention to the importance of detecting stricture of the urethra in its earliest stage. The ideas as to the sign denoting the presence of stricture were vague. Mr. Teevan defined stricture to be "any diminution of the normal calibre of the urethra, the result of the contraction of organized lymph." The presence of a gleet of six months' duration or more, might commonly be regarded as the outward and visible sign of the existence of a stricture which might, perhaps, in no way interfere with the flow of urine; and the actual presence of such stricture might be demonstrated by the *bougie à boule*. That instrument was invented by Sir C. Bell, and was by him made in metal. Leroy d'Etoilles improved its usefulness by making it of an elastic material, which allowed the instrument to follow the deviations of a tortuous and deformed urethra; its diagnostic value was still further enhanced by Dr. Henry Dick, who had the shoulder of the bougie made sharp and angular. The *bougie à boule* was simply for diagnosis. It would, as it was being withdrawn, catch at the slightest unevenness in the urethra, and told accurately the slightest change in the mucous membrane.

That tissue, in its normal condition, transmitted through the bougie the sensation of travelling along a velvety path; and, if there were any constriction, not only would that fact be communicated to the surgeon, but also the degree of pathological change which the urethra had undergone. The *bougie à boule*, therefore, would detect stricture of the urethra in its earliest stage; and the treatment of such stage might correctly be termed the preventive treatment. When a patient went to a surgeon for a gleet, he ought always to be examined with the *bougie à boule*, for it was necessary to ascertain the pathological condition of the canal before an appropriate treatment could be decided on. If there were no constriction, deep injection was proper; but if there were contraction, however slight, it would be aggravated by injection, but cured by gradual dilatation. Mr. Teevan, after enunciating M. Mercier's views of the pathology of stricture, discussed the seats of stricture, as deduced from facts observed by himself. He grouped together stricture at the bulb or membranous urethra, and called it "subpubic." This was by far the most common kind of stricture, simply because the triangular ligament favoured its production. The next stricture in order of frequency was the "penile," situated at a spot varying from two-and-a-half to three-and-a-half inches from the meatus externus. This stricture was rarely absent, in some degree, when the other was present. The rarest form of stricture was that just within the meatus, the "orificial." Strictures, regarded in their physical conformation, were of two kinds—the "tunnel" stricture and the "ring" stricture. He called them so on account of the sensations communicated to the *bougie à boule* when passing through them. Subpubic strictures were generally of the tunnel kind; orificial strictures were of the ring character; and penile strictures partook of both forms. The measurements given of the length of the urethra varied from seven to eight or nine inches. He had found the average length to be seven and one-eighth inches, as deduced by himself, from measuring the urethra of one hundred males. Regarding the treatment of stricture, he stated that, after witnessing the practice of various surgeons, and trying different methods, he had come to the conclusion that there was no treatment equal to that of gradual dilatation by means of the *bougie olivaire* and the piliform bougie, which treatment, he believed, he was the first to introduce into English hospital practice. Forceful dilatation was only applicable to the easier kinds of strictures; it was not devoid of danger; it caused an unknown lesion; it had to be always followed, and often preceded, by gradual dilatation, so that it could only be regarded as an occasional auxiliary in the treatment of stricture. Gradual dilatation was the safest treatment for the patient, for, out of one thousand recorded cases, there had not been one death; all the sufferers could be treated as out-patients, and no man need ever lose an hour's work during the treatment. The *bougie olivaire* glided in so easily that the patient was scarcely aware of its presence. It was necessary to pass an instrument about once in every three or four months, even after an apparent cure. Dilatation ought to be conducted up to the highest size that the urethra would take.—*Brit. Med. Journ.*, Nov. 6, 1869.

55. *Holt's Dilator for Stricture*.—Mr. D. M'GREGOR, late Superintendent of Barnhill Hospital and Asylum, says (*Ed. Med. Journ.*, Oct. 1869): "Although this instrument has been several years in use, I do not think advantage has been taken so extensively as might be of its decided usefulness. Only in four cases have I had occasion to use it, and in all the four with the most perfect success. Indeed the cure was so remarkable that I think (if I may be allowed to judge from so limited a number) in all suitable cases for this instrument it is a needless loss of time, in hospital practice at least, to spend weeks upon the gradual dilatation of stricture when it can be safely done in most cases in fewer days. In my four cases I had a difficulty in passing a No. 2 catheter at first into the bladder, after which Holt's instrument was passed, and the stricture ruptured or forcibly dilated, so as allow a No. 10 gum elastic to pass with ease. In none of the cases did a bad symptom follow, except a slight shivering in one; and, save passing the No. 10 once a day for two days, there was no further interference necessary. The urine was passed in all of them in a large and easy stream, and they were at once dismissed well. I noticed, in his recent excel-

lent lectures on the surgical diseases of the urinary organs (published in the *Lancet*), that Sir Henry Thompson, though he speaks favourably of Holt's dilator, prefers cutting stricture by means of a bladed instrument introduced into the urethra. I consider this, however, a much more difficult and dangerous proceeding than the other, while I scarcely think it more successful."

56. *Dr. Dolbeau's Use of Alcohol in Dressing Surgical Wounds.*—The following is Dr. D.'s (the eminent surgeon of Hôpital Beaujon) plan of proceeding. Having performed the amputation, or removed the tumour, as the case may be, he stanches the hemorrhage, by such means as are appropriate and usual in the circumstances. He then washes the wound with what he calls *pure alcohol*; or, in other words, with the strongest commercial alcohol, unmixed with water. The next proceeding is to dry the bleeding surface with fine soft linen. The dressing is now applied. This consists in filling up the cavity caused by the loss of substance, or covering the flaps of the amputation with feathery tufts of fine charpie soaked in pure alcohol. The part is then farther covered with compresses, which likewise are soaked in pure alcohol. The dressings are then inclosed in a double envelope of the impermeable gutta percha tissue, which has of late years superseded oiled silk for most medical and surgical purposes, and which is superior in respect of elasticity and cheapness. The whole of the dressings and coverings now described are retained in position by a few rounds of a bandage.

The dressings now described—applied, be it observed, when all bleeding has ceased—remain undisturbed till the following day, when they are entirely renewed. During the course of the day, it is useful to open up the impermeable covering, and, without touching the underneath dressing, moisten it with pure alcohol. At each dressing, it will be found that the charpie is adherent to the raw surface: to detach it without causing an oozing of blood, the dressings ought to be moistened by means of syringing it with alcohol.

When the proceedings as above described are carried out with exactitude, there is no bleeding from the wound, and the parts are kept in a favourable state of moisture. At the end of a period, varying from five to ten days, the raw surface is quite dry, and presents a slate-gray appearance. The surface may be kept in this dried-up state—in this condition of local embalmment—as long as is desired. Cicatrization proceeds very, very slowly; and to accomplish permanent healing, it is necessary to induce suppuration in the wound.

Dr. Dolbeau holds that his method of alcoholic dressing prevents the occurrence of traumatic inflammation; and I am assured by friends who have had considerable opportunities of observing his hospital practice, that this opinion is well founded. He says—and this I have personally observed—that the patients have generally little or no fever, and that their strength is inversely proportionate to the suffering they have had or the quantity of blood they have lost in the operation. By keeping the wounds in the state of alcoholic dryness (*sécheresse alcoolique*), as Dr. Dolbeau calls it, traumatic reaction is prevented; and by that means, any necessary length of time is obtained for the patient to get up his strength.

When all goes well—when the appetite and sleep are natural—when strength is regained, the alcoholic treatment is discontinued, and glycerine is used. The time has now come, according to Dr. Dolbeau, when, without detriment, the patient can support suppuration. The surgeon, however, after instituting suppuration by dressing with glycerine, may, if he think it necessary, arrest or diminish the formation of pus by using pure alcohol, or a mixture of alcohol and water.

At first, the alcoholic treatment occasions a good deal of pain; but, by the end of the second or third day, the wound has become insensible. Some patients beg urgently that the alcohol may be used somewhat diluted with water, but Dr. Dolbeau says that this demand ought to be resisted.

The direct application of pure alcohol often vesicates the skin surrounding the wound. When this inconvenience occurs, it is easily remedied by powdering the blistered surface with starch or rice. In a few exceptional cases, the lips of the wound become greatly swollen, while the surface of the wound has

the usual alcoholic dryness and the usual slate-gray colour. In such cases, Dr. Dolbeau discontinues using the alcohol, and has recourse to starch poultices. Once the swelling has disappeared—an event which occurs simultaneously with the establishment of copious suppuration—Dr. Dolbeau resumes the use of the glycerine dressing, and syringes the wound every morning with pure alcohol, so as to cause the separation of all the portions of tissue destroyed by the suppuration.—*British Med. Journ.*, Nov. 20, 1869.

57. *Diseased Elongation of the Bones of the Extremities in Relation to Surgical Practice.*—Prof. LANGENBECK, in a recent paper read to the Berlin Medical Society, draws attention to a consequence of disease of bone first noticed by Stanley, and further demonstrated by Paget. He observes, that until the twenty-third or twenty-fifth year, the bones may, under the influence of general disturbances of nutrition or local disease, undergo greater variation in form and size than the soft parts. In the rickety subject defective length is a more characteristic sign than either the curvature or the chemical condition of the bones. The influence of paralysis in checking the growth of bone requires more investigation, for while in some cases this is found to be imperceptible, in others it is very considerable. Affections of the epiphyses and of the joints will naturally give rise to considerable shortening, and all the bones of the same extremity may participate in this on account of the forced inactivity. The same effect is also observed when the joint itself is not diseased, but kept in a state of forced contraction; but here probably the result is a mechanical one produced by the altered mode in which the deposit of new bone is made. How small a power need be exerted to produce this effect is seen in the fact, that when fingers are united together, but are yet able to perform all their principal functions, their bones, if the web be not properly divided, will remain shortened. In a still greater degree the same effect is exerted by cicatrices from burns in the neighbourhood of joints.

It is, however, to abnormal elongation of the bones that attention is chiefly directed in this paper. This may easily take place to the extent of one or two centimetres, or more, without detection, unless careful admeasurements be made. A long bone, as a general rule, grows longer and thicker in proportion as it has been in an inflamed or hyperæmic condition, and a hyperæmic condition of the soft parts is also competent to produce this change. Thus, in a case of inguinal aneurism, Broca found that the femur had increased two, and the tibia one centimetre in length. Ulcers of the leg occurring early in life produce the same effect; and although chronic inflammation and caries of joints exceptionally arrest the growth of bone, in other cases they lead to its elongation. The great majority of cases of increased growth, however, arise from chronic disease of the diaphysis of the bone, *i. e.*, osteo-myelitis or necrosis.

A very interesting case is given in which careful admeasurements were made at the autopsy, and all the bones on the diseased side were found considerably longer. A remarkable appearance noted was the diminution of the circumference of the upper articular surface of the tibia by one, and of the lower surface by half a centimetre. This may be attributed to the fact of the greater longitudinal development of the diaphysis having taken place at the expense of the epiphysis. In the arrested growth of the rickety bone, on the contrary, the circumference of the articular surface is increased. The fibula, in the above case, although not diseased, had increased by two centimetres in length like the tibia. Another important point was, that the femur of the same side also underwent considerable elongation, for while the tibia was found to have increased by two centimetres, the whole limb, measured carefully during life, was found to be five centimetres longer than the other. Similar observations are reported by Paget and Bergmann; and Langenbeck has met with the same circumstances in the upper extremities.

Bearing the above facts in mind, it occurred to Prof. Langenbeck whether they might not have their surgical application in the treatment of shortening of the bones of the extremities. As necrosis occurring in young subjects is the most frequent cause of abnormal elongation of bone, and is probably due to the abiding stimulus of the sequestrum, it might be expected that the insertion

of a foreign body in the bone would be attended by a similar result. He therefore instituted some experiments on young dogs, employing Dieffenbach's ivory pegs as having a near resemblance to bony structure. These were followed by most favourable results, the effects being in fact just the same as those observed in necrosis, viz., an elongation and thickening of the shaft, and a lessening of the epiphysis. Moreover, the bone remained undistinguishable in any other respect from normal bone, being neither inflamed nor in any way diseased. So the matter stands at present, for although Professor Langenbeck believes that surgical interference will be advantageously employed in this direction, he has not yet resorted to it. He observes, that while a few centimetres shortening is of little consequence as regards the upper extremity, it is of serious import in the lower, and any reasonable means of removing it or diminishing it should be employed. Excision of the joints in children will acquire an additional importance also, if we are enabled by the introduction of one or two of the pegs immediately after the operation to prevent the arrest of growth in the limb. Subjects suffering from paralysis are favourable for the trial of the means, as they will with less difficulty sacrifice the five or six months necessary to be passed in quietude to secure the success of the experiment. One of the most important results of the trials made on dogs is the demonstration of the efficacy of extension in elongating bone. The fibula, to which nothing has been done, was found to have increased two centimetres as well as the tibia, and yet to have undergone no displacement. This was effected by the stretching effect exerted upon it by the tibia, to which it had become united in one bony mass. Of the possibility, by suitable extension of increasing the length of shortened bones, there can be no doubt, although the determination of the amount of this by admeasurement is very difficult.—*Berlin Klinische Wochenschrift*, June 28.

[In relation to the above subject a very interesting paper by Drs. Weinlechner and Schott, which we have not space to notice, will be found in the *Jahrbuch für Kinderheilkunde*, 1869, heft 3, entitled, "On Elongation and Shortening of Bones after Fractures, Caries and Necrosis and Inflammation of the Joints."]—*Brit. and For. Med.-Chir. Rev.*, October, 1869.

58. *Bending of the Radius in an Adult*.—Dr. R. FARQUHARSON records (*British Med. Journal*, Dec. 4, 1869) the following case of this rare occurrence:—

"On the 15th of last October, I was watching a football match on Rugby School Close, when J. S., aged 18, asked me to look at his right arm, which had been injured during the game. On cursory inspection, I could detect nothing far wrong; and, considering his symptoms due to a severe bruise, merely recommended rest and fomentation. Next day, he again presented himself, stating his conviction that he had bent his forearm by the accident. Naturally rather incredulous, I made a careful examination, and found that he was quite right, and that a well-marked distortion really existed. Both bones were affected in some degree; but the chief strain had been experienced by the radius, which described a considerable curve, with the convexity inwards. No feeling of crepitus could be detected, nor any trace of irregularity along the margin of the bone; and motion, although attended by slight pain, was altogether unaffected. The deformity readily yielded to firm manipulation over the knee; but, as it speedily returned on the withdrawal of the force, it was necessary to apply an anterior and posterior splint.

"On October 20th, the splints were removed; but the bend of the radius, though decidedly less marked, could still be observed. Reduction, if I may so call it, being effected as before, the splints were readjusted. On October 26th, on uncovering the arm this morning, it was found to have entirely regained its normal shape; a slight degree of weakness and stiffness only remaining. Since that date, it has rapidly recovered strength, and has never given rise to uneasy sensations of any kind."

What is remarkable in this case is that no predisposing cause could exist; for the patient "was not only stout and well developed, but of special activity in those games which most severely test the frame. We must, therefore, look upon the case as one of an exceptional nature, in which rending of a perfectly sound bone took place, irrespective of fracture; and the record of such an event

may save others from the error, into which I so nearly fell, of overlooking the true nature of the injury; for, although the consequences of such an omission might not be very serious, the resulting deformity, however slight, would sooner or later have proved an annoyance, and brought discredit on the medical art. It is, therefore, fortunate that the marked way in which my attention was drawn by the lad to the nature of his lesion prevented my being led astray by the recollection of our ordinary surgical principles."

59. *Foreign Body in the Rectum*.—POLLACK (KAPOSVAR), in the *Wien. Med. Presse*, 1869, No. 8, relates the case of a mendicant, 50 years old, who, in consequence of a foolish bet, allowed a champagne flask to be thrust through the anus into the rectum, where it was allowed to remain for twenty-six days; the patient, in the meantime, lying without proper care, in a stall partly filled with straw, and suffering from the most excruciating pains in the abdomen. The bottom part of the flask could be felt just within the anus, and its mouth could be traced, through the abdominal parietes on the left side, and about the breadth of two fingers below the xyphoid process. Dr. P. and several of his colleagues failing, after repeated efforts, to extract the flask by means of the fingers alone, it was suggested that a steel rod, with a lozenge-shaped point, be carried up along side the flask, within the anus, and a hole bored through the curve formed between the sides and neck of the flask; through which hole a strong hook attached to a suitable handle was passed. By cautious traction with the latter the flask was slowly removed. It measured in length $12\frac{3}{4}$ "', in diameter, at its neck, $1\frac{1}{2}$ "', at its middle $2\frac{3}{4}$ "', and at its bottom $2\frac{3}{4}$ "'. After the extraction of the flask the patient soon regained his ordinary health.—*Centralblatt f. d. Med. Wissenschaft.*, May, 1869, No. 25. D. F. C.

OPHTHALMOLOGY.

60. *Transitory Blindness in Acute Diseases*.—DR. TOLMATSCHEW (*Jahrb. f. Kinderheilk.*, New Series, II.), to the few cases previously on record of the occurrence of transitory blindness in acute affections, adds the account of another observed by him. In a patient 12 years old, labouring under an attack of ileo-typhus, towards the end of the 4th week, with the return of perfect consciousness, it was observed that the patient had become so blind as to be unable to distinguish objects, possessing simply a slight ability to distinguish between light and darkness. The blindness continued for some seven days, after which normal vision was gradually regained, but considerable time elapsed before the previous acuteness of vision returned. No mention is made of any special treatment having been entered upon in consequence of the blindness. No ophthalmoscopic examination of the eye appears to have been made.—*Centralblatt f. d. Med. Wissenschaften*. 1869, No. 24. D. F. C.

61. *Cases of Syphilitic Affection of the Third Nerve producing Mydriasis with and without Ptosis*.—The cases communicated by Mr. VICTOR DE MÉRIC to the surgical section of the British Medical Association at its meeting in July last, were all clearly traceable to the syphilitic taint; they were five in number, and Mr. de Méric related a sixth, where a syphilitic taint could not be made out, but where mercury acted very advantageously. From a survey of these cases, it became evident that the prognosis is generally favourable, the malady being amenable to treatment, which, in these instances, had consisted in the administration of mercury or iodide of potassium—according to the stage of the disease—the use of the Calabar bean, and the electric current. Medical literature had, from time to time been enriched with cases of this kind; and these, coupled with Mr. de Méric's cases—the details of which had been carefully noted, and the diagnosis accurately laid down—proved that syphilis, besides occasionally causing disturbance in other portions of the nervous

system, may directly influence the functions of the motor oculi nerve. The author directed attention to the rarity of these cases, as he had collected but five during a special and private practice of 23 years. He was inclined to think that, in syphilitic affection of the third nerve, the sheath of the trunk or filaments principally suffered; as tumours, clots, and abscesses, would not so easily have yielded to treatment. In the instance where mydriasis had existed without ptosis, he suspected, with some ophthalmologists—especially with Mr. Wharton Jones—that the sympathetic twigs were mostly at fault. Mr. de Méric declared himself a believer in the action of remedies in general, and mercury in particular, although scepticism was, just now, in great favour. He had freely used mercury or iodide of potassium in these cases—according to the period to which the syphilitic diathesis had arrived—and was ready to advise the same line of treatment in analogous affections. The cases proved, moreover, that the third pair may be the seat of a pathological change, due to syphilis, whether the latter be recent or inveterate, or whether the symptoms be of a trifling or a very serious kind.—*Brit. Med. Journ.*, Nov. 6, 1869.

MIDWIFERY.

62. *Uterine Hemorrhage after Labour.*—Dr. BARNES read before the Obstetrical Society of London, Nov. 3, 1869, a paper on this subject. He endeavoured to define the conditions on which arrest of hemorrhage after labour depended; the action of the common remedies; and the indications of particular remedies. The ordinary remedies excited contraction of the uterus; this presupposed nerve-force enough to respond to excitation; but, when this was exhausted, remedies failed. It became then necessary to seek a new power. This was found in styptics, like perchloride of iron, which coagulated the blood in the mouths of the open vessels, and corrugated the inner surface of the uterus. Ergot, compression of the uterus, and cold, should not be trusted if they failed to act quickly. If persevered in beyond this point, they did harm. Ergot and cold added to the depression; kneading might bruise the uterus; all were apt to occasion puerperal fever. The perchloride had, in several cases, been followed by death when used for injecting nævi; but this was essentially different from injecting the uterus. In his practice, he had observed three orders of cases: in the first, all recovered well, the hemorrhage being immediately stopped. In the second series, recovery occurred, phlegmasia dolens supervening; but this was not usual after severe hemorrhage. In the third, death followed; but the patients were moribund when the remedy was applied. Here the remedy was transfusion. The practical lesson was not to persist too long in the use of cold, kneading, and other remedies, but to resort to the perchloride before collapse had set in. Dr. Barnes showed a convenient case, constructed by Krohne and Sesemann, containing a set of his dilators, a Higginson's syringe with uterine tube, and a bottle for perchloride of iron.

Dr. ROGERS had used the perchloride of iron in five or six cases during the last fifteen years—always with success. He thought Dr. Barnes had omitted to mention galvanism.

Dr. CLEVELAND referred to the difficulty of determining when the application of the ordinary means should cease, and of leaving the patient in order to prepare an injection. An India-rubber bottle attached to a small catheter was more easily used than Higginson's syringe. He had seen vomiting do good on one or two occasions. He asked whether the use of stimulants was not open to objection.

Dr. WYNN WILLIAMS had for a long time used the perchloride of iron, applying it by means of a sponge to the interior of the uterus; the sponge was left in the uterus with a string attached.

Dr. BRAXTON HICKS said that there was much difference in the state of the interior of the uterus after the removal of the placenta. Sometimes the large

apertures of the sinuses described by authors were absent. In other cases the sinuses, in their oblique passage through the uterine walls, abutted on the line of separation of the placental decidua; and when the placenta was removed, severe hemorrhage would result. In the former case, the perchloride would readily act; in the latter, probably even it would fail to arrest hemorrhage.

Dr. HALL DAVIS had for several years employed iron solutions with success. He found the perntrate, the persulphate, and the perchloride, about equally successful.

63. *Case of Puerperal Eclampsia; Transfusion of Blood; Recovery.*—Dr. W. LANGE, believing that the true puerperal eclampsia is the result of the morbus Brightii, adopts transfusion of blood as its only rational remedy. He relates a case in which it was successfully employed. The patient had, previously to her confinement, twenty-five convulsive attacks; and, subsequently, notwithstanding local bloodletting, the application of ice, inhalation of chloroform, and morphia by injection, she experienced seven attacks of equal severity. There were now seven ounces of defibrinated blood injected into one arm, while from the other fourteen ounces were drawn. Immediately the patient's respiration became freer, the cyanosis of the face disappeared, and only a single convulsive paroxysm occurred, less violent and of much shorter duration. —*Centralblatt. f. d. Med. Wissenschaften*, Jan. 1869, No. 7. D. F. C.

64. *Closure nearly Complete of the Orifice of the Vagina.*—A primipara was delivered of a dead child by turning and subsequent extraction. Soon after delivery she experienced a frequent desire to urinate, which could not be resisted. The entrance into her vagina she observed became also more and more constricted, until, at length, coitus became impossible. By perseverance, however, the husband at length effected an entrance, in so doing causing his wife to suffer great pain. Upon examination, Dr. UTERHART (*Berl. Clin. Wochenschr.*, 1869, No. 24) found the two edges of the orifice of the vagina united together by granulation throughout nearly their entire extent; the union ending above in a free edge, and, as it were, extending directly into the nymphæ. Above, at the point of union, and partly covered by it, was found a wide, funnel-shaped depression, which was the commencement of the urethra, through which the finger could be readily passed into the bladder. Below the inferior edge of the enlarged urethral orifice the finger passed into what seemed a blind sac, but on trial it was found that a catheter could be passed through a small opening into a canal several inches long, and then could be moved freely sideways. From this opening to the full extent of the vaginal orifice, Dr. U. split open the united parts, and took measures to prevent their reunion, until the mucous membrane of the vagina became continuous with the skin of the external parts. After two operations, a permanent *introitus vaginae* was effected, in each diameter of which two fingers placed alongside one of the other could be introduced into the non-contracted vagina, the functions of which were unimpaired. The opening into the urethra contracted finally into a narrow slit, the inclination to urinate gradually disappeared, and the normal power to retain the contents of the bladder was regained. —*Centralblatt. f. d. Medicin. Wissenschaften*, Aug. 1869, No. 38. D. F. C.

65. *On the Treatment of Laceration of the Perineum.*—Dr. JOHN BRINTON, Surgeon to the Royal Maternity Charity, London, contributes a paper to the *Glasgow Medical Journal* for November, 1869, in which he advocates the sewing up of the rent immediately after delivery. He narrates three cases so treated, and remarks: 1st. That the result of the recent operations is very satisfactory. 2d. That the operation is very easy. 3d. That it is comparatively free from danger, and is nearly painless, requiring no chloroform, because the parts which have been torn are in an anæsthetic state, being benumbed by the pressure they have recently undergone.

66. *Oxalate of Cerium in the Sickness of Pregnancy.*—There has recently been adduced some strong evidence of the efficacy of the oxalate of cerium,

recommended some years since by Sir James Simpson, for the sickness of pregnancy. Mr. EDWIN BUSH states (*Brit. Med. Journ.*, Nov. 27, 1869) that he has never been disappointed with it, in many cases giving five grains three or four times a day in water. He says further, that in cases of persistent irritable stomach, arising from uterine disturbance in unmarried females and in the absence of pregnancy, he has invariably found it a good remedy.

67. *Use of Instrumental Means for Uterine Displacements.*—Prof. NIEMEYER, in his *Text-Book of Practical Medicine*, indorses the opinion of Scanzoni with regard to the abuse of instrumental means for every conceivable form of uterine displacement. He observes: "We have already said that total disappearance of a flexion must, to a certain extent, be considered as a physiological impossibility, as it is almost always accompanied by atrophy of the parenchyma of the uterus at the point of flexion. 'Flexion instruments,' sounds, redressers, and intra-uterine pessaries, which were for a time much used for flexions, do actually no good, but much harm. Scanzoni has stated plainly that in his large gynecological practice he has never cured a flexion, and that he considers the use of flexion instruments as of no use and dangerous. Tonics, also, whether used externally or internally, promise no benefit. The advice that patients with ante-flexion should hold their urine as long as possible, so that the distended bladder may raise up the fundus, and that patients with retroversion should retain the feces for the same reason, is given from theoretical grounds, and has not proved correct. (Virchow says that ante-flexion results from great distension of the bladder while the uterus is fixed.) Most gynecologists advise wearing a firm girdle around the pelvis and lower part of the abdomen, and many patients praise the result of this treatment. It is difficult to understand that, even in retroflexion, pressure on the lower part of the abdomen should relieve the patient. Perhaps, their greater ease may be due to the compression of the uterus and its consequent bloodless state.

"Little as we can do to remove the flexions, we may do much to relieve the sufferings of the patient if we treat the catarrh and parenchymatous inflammation of the uterus, which first call attention to the flexion, according to the rules laid down in previous chapters. Occasional abstractions of blood from the portio vaginalis are peculiarly beneficial, and are almost always effective in cases of flexion."

68. *Uselessness of Drugs in the Treatment of Organic Growths from Uterus and Ovaries.*—Dr. ALFRED MEADOWS, Physician to the Hospital for Women, expresses (*The Practitioner*, Nov. 1869) his utter disbelief in the supposed power of drugs, whether given internally or applied externally, to remove growths from the uterus or ovaries. "Whether or no," he adds, "there are any agents capable of producing the desirable effect I am not prepared to say, but we certainly have not discovered them yet."

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

69. *Poisoning by Spirits of Ammonia.*—In the *Würtemb. Med. Corresp. blatt*. No. 37, 1868, Dr. KERN relates the case of a man 70 years of age, of intemperate habits, who took two swallows of spirits of ammonia; he was immediately afterwards seized with a sense of suffocation, cough, and vomiting, and, notwithstanding the means resorted to for his relief, within four hours he died; death being preceded by delirium, stupor, and spasms. A post-mortem examination showed the mouth and throat denuded of epithelium, and inflamed, in the stomach there was found a bloody fluid smelling of ammonia; at its lower portion the epithelium of the stomach was destroyed, and the muscular coat changed into a black pulpy substance. The duodenum and the serous coat of the stomach nearest the bowel were inflamed. The blood remained of a thin

fluid consistence. The body also presented the marks of the dyscrasy usually resulting from a life of intemperance. Of death from the swallowing of spirits of ammonia there are said to be only two other cases on record.—*Centralblatt. f. d. Medicinisch. Wissenschaften*, Jan. 1869. D. F. C.

70. *Phenomena Attendant upon Death by Lightning-Stroke*.—Dr. B. W. RICHARDSON has recently exhibited some highly interesting experiments performed with Prof. Pepper's induction coil, the most powerful one ever constructed, with the view of settling some doubtful points of great importance in regard to the phenomena of death by lightning.

The conclusions which Dr. R. drew from his experiments are as follows:—

1. Of the three orders of electrical discharge we have produced to-day, one only, that from the Leyden battery, is instantly fatal. In this form of discharge, therefore, we see the quality of lightning-stroke which suddenly destroys life.

2. There may be an electrical discharge made up of two distinct flashes—a tense flash combined with a burning flame or flash. The first of these is destructive to life; the second singes, scorches, perhaps blinds, but does not necessarily destroy life. In lightning shocks we may see, in the effects produced, the evidence of one or other of these discharges, or of both on one and the same subject.

3. The electrical discharge, according to its intensity, produces two distinct conditions—one a condition of nervous insensibility (anæsthesia), with continuance of involuntary muscular action, ending in recovery; the other a condition of both nervous and general muscular insensibility, ending in death.

4. After death from electrical shock, there is well-marked, often intense, and prolonged muscular rigidity—rigor mortis.

5. After death from electrical discharge, there is coagulation of blood, but the process is developed slowly within the body.

6. Animals killed by electrical discharge do not, from the mode of death, undergo putrefactive change with any exceptional rapidity.—*Med. Times and Gaz.*, May 15, 1869.

71. *Death from taking Chloroform into the Stomach*.—Dr. E. FITZAU (*Deutsche Klinik*, 1869, No. 21) relates the case of a physician, 57 years of age, who swallowed 90 grms. of chloroform: he commenced immediately to stagger, like one intoxicated. After vomiting he sank into a deep stupor, attended with severe anæsthesia; his skin was pale and tolerably warm; his muscles were relaxed; his respiration short, and the action of his heart weak and intermittent. After the use of the stomach pump and different excitants, the epiglottis being depressed to prevent impending suffocation, an elastic tube was passed into the trachea, and immediately respiration became more free, and in about 14 hours sensibility returned. An acute gastritis became developed and rapid collapse ensued, and terminated in death at the end of 29½ hours from the time the chloroform was taken.—*Centralblatt. f. d. Med. Wissenschaft.*, Sept. 1869. D. F. C.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Successful Resection of the Ends of an Ununited Humerus, after the failure of the Seton. By WILLIAM A. GOTT, M. D., of Viroqua, Vernon Co., Wisconsin, and late Surgeon 25th Regiment Wisconsin Infantry.

A. O., æt. 40, farmer, with impaired constitution from intemperate habits, fractured his left humerus by a fall in the early part of the spring of 1861. The fracture was dressed by an ignorant practitioner, and bony union did not follow. I was consulted in the month of July following, and found at least one inch of shortening in the limb with so great mobility at the seat of the injury—the junction of the middle and lower thirds of the arm—that an effort to hold the arm in the horizontal position was attended with marked angular deformity. The limb was atrophied and its movements so limited as to prevent his engaging in any employment.

The patient had consulted me with the intention of submitting to amputation of the arm, which he had been led to believe by his friends was the only alternative, and on being assured that such a procedure would be unwarrantable, and that the arm could be restored possibly by an operation, he expressed his gratitude, and at once determined to submit to any operation that I might propose. Before resorting to operative measures, however, I deemed it important to correct the impaired state of his health, and accordingly placed him upon the use of iron and a nutritious diet.

Sept. 4, 1861. The patient visited me to-day according to previous arrangement, and with his general health so much improved as to warrant the performance of the proposed operation. The soft parts immediately over the seat of the injury posteriorly were incised to the extent of an inch to the bone, and a seton was introduced between the fragments in the usual manner. The limb was then securely placed in an angular splint.

April 4, 1862. The seton, having failed to accomplish the desired result, was removed to-day. I now proposed to the patient that he submit to the operation of resection of the ends of the fragments, to which he readily assented.

June 4, 1862. The operation was performed to-day with the assistance of Dr. H. G. Weeden, of Viroqua, and in the presence of a number of the friends of the patient. The patient having been fully placed under an anæsthetic composed of one part of chloroform and two parts of sulphuric ether, a straight incision, five inches in length, was made on the posterior aspect of the arm through the integuments and muscular tissues down to the bone, by which the parts were fully exposed, and showing that firm ligamentous union had taken place, binding down the ends of the bone. The fracture was an oblique one, and the lower fragment was overriding the upper, thereby causing the shortening. The ligamentous bands were divided, and the fragments that had become rounded and tapering at the ends were removed by means of the metacarpal saw (a chain

saw not being at hand) to the extent of half an inch so as to leave each end with a surface of the size of the natural circumference of the bone. In effecting this, great care was taken to avoid any undue laceration of the periosteum, which was dissected up to the point of division of the fragments. With a stout, short awl, a hole was drilled obliquely in each end of the bones, half an inch from their free extremities, through which a piece of small annealed iron wire was introduced, and this was twisted firmly, after the square surfaces of the bones had been brought in apposition. The hemorrhage was very trifling, the extremities of the wound were brought together with interrupted sutures, and the limb made secure in an angular splint loosely confined by a roller. Cold-water dressing was applied.

6th. Patient has suffered but little pain since the operation. There is considerable tumefaction of the integuments of the arm. Cold-water dressing directed to be continued.

July 6. Appears to be doing well; union by bone rapidly taking place. The wire loop is gradually loosening, and gentle traction upon it has been made from day to day for a week past. No undue irritation of the parts has been produced from the presence of the wire, the wound having closed except where the twisted wire is projecting. I was now obliged to leave the case in charge of Dr. H. G. Weeden (I having been ordered to join my regiment without delay), who from time to time kindly furnished me with the progress of the case.

Aug. 6. Osseous union quite firm, an abundant ossific deposit having taken place around the fragments, observable as well by the eye as by the touch. The wire is still retained, and as its presence does not occasion any inconvenience, it was thought best not to withdraw it forcibly.

Sept. 10. The loop of wire dropped from the wound to-day as the patient was applying some simple dressing. For the past few weeks he has been making as much use of the arm as its strength would admit of, and in so doing finds that its proper functions are being gradually resumed.

Remarks.—One interesting feature in the progress of this case is the length of time the wire-loop remained *in situ* without producing any bad result; indeed, it seemed that its prolonged retention served as a stimulus to the bone, encouraging the abundant throwing out of ossific matter. Be that as it may, it is very evident that the objections of some surgeons in respect to the use of wire, whether silver, copper, or iron, in injuries of the bones, are altogether unfounded, and that the wiring method in cases of false joint and certain kinds of fractures, is far preferable both in safety and certainty to the operations usually recommended by surgical authors, especially those of the conservative school.

The necessity of the free incision of the soft parts in order to expose the ends of the fragments, the proximity of important bloodvessels and nerves, the removal of so much of the bony structure as is often necessary, make the operation seem rather formidable compared with the usual methods. In this case, however, the local and constitutional disturbance was very slight, much less than could have been reasonably expected from so extensive an operation, and in a constitution already somewhat broken down by various excesses from early youth.

Epileptoid Convulsions caused by Carious Teeth. By JOHN W. BOOTH, M. D., of Tally-Ho, N. C.

October 7th, 1868, I visited an unmarried lady in an adjoining county

in consultation with a respectable physician of that county. She had epileptoid convulsions affecting principally some of the muscles of the neck and the right arm. These attacks had been of almost daily occurrence for four years. She had nearly continuously during this time taken many and various remedies empirically, the cause of her affection not having been ascertained, without the slightest appreciable benefit. There was a very slight disposition to anæmia, and beyond this, there was not a symptom upon which to base a diagnosis or therapeutic indication. Appetite, digestion, general health all good, circulatory and generative apparatus acting normally.

In giving the history of her case, she stated that her first spell came on during an attack of toothache. Upon examining her mouth we found half a dozen carious teeth, and determined that to extract those teeth would afford the best chance of relief. Accordingly all the carious teeth were promptly extracted. There has been no return of the convulsions since. This lady has now improved considerably in flesh, and presents no anæmic phenomena. I need hardly add that her spirits are improved in an equal degree.

January 30, 1869.

Ulcer of the Stomach; Death from repeated Hemorrhages. By JOHN J. BLACK, M. D., New Castle, Delaware.

I was summoned, September 7th, 1869, to visit a very intelligent well developed healthy looking young lady, 23 years of age, unmarried. She was lying on the parlor floor, face pale, features contracted, and pulse very weak. Her mother told me that up to this evening she had considered her in perfect health—probably complaining less than any of the family. She had eaten a hearty tea, and gone into the parlor, and was sitting at a table writing, when she suddenly became nauseated, called for a vessel and vomited about 32 ounces of clear bright red blood, together with the partially digested meal. She had another similar hemorrhage of about 40 ounces September 9th, one of about 12 ounces September 17th, and one of about 10 ounces September 21st. Early on the morning of October 1st she died. She rallied well from each attack until the last, after which she remained very weak, gradually sunk, and died as above stated. She exhibited remarkable fortitude during her illness, and her mind remained unclouded until the last.

The treatment consisted of anodynes by the rectum; liquid subsulphate of iron as an astringent internally. A little ice occasionally; nutritious enemata, and abstinence from solid food. For twenty days she was supported exclusively by enemata of beef-tea guarded by a little tincture of opium, and occasionally some sulphate of quinia. She took about five ounces every four hours. At last the bowel rejected the enemata, and we were forced to support her freely by the stomach.

On careful examination of the lungs, heart, and great vessels, nothing abnormal could be detected; leading us to believe that the hemorrhage resulted from ulcer of the stomach, involving a bloodvessel of considerable size.

Dr. Allen V. Lesley, of New Castle, was kind enough to see the patient with me, and our views of the case fully coincided. The *post-mortem* thirty-two hours after death confirmed the diagnosis made; body much emaciated and nothing abnormal found until the stomach was opened, when on its posterior surface a little below its median line and a little nearer to the

pyloric than the cardiac orifice, there appeared a firm clot of blood about the size and shape of a small almond kernel. When this was removed we found a perfect specimen of the "punched" ulcer of the stomach; elliptical in shape, scarcely one-fourth of one inch in its long axis, and one-eighth of one inch in its short axis; edges somewhat thickened and raised, and penetrating nearly to the peritoneal coat. A red line ran outwards, which proved to be an artery of considerable size, not quite cut off, and through which a small probe could pass towards the coronary artery of the stomach. Had the clot not been present, the ulcer might possibly have escaped detection, and it really appalled one to look at it, and to think that so small a lesion should destroy a valuable life. A very careful examination showed no other lesion, and the only other abnormal condition in the whole alimentary tract was an hyperæmic condition of the cardiac end of the stomach. This was examined carefully without finding the smallest solution of continuity.

This case is peculiarly remarkable from there being no premonitory symptoms of ulcer of the stomach, and up to the time of the first appearance of hemorrhage she was considered by her friends and herself in robust health. Upon close questioning, she admitted that for several months she suffered now and then from a little regurgitation of food after eating, but never vomited or had nausea, said she had had at times a little pain between the shoulders which was augmented when she had been driving, but still she never had any symptom to trouble her enough to complain seriously of it. The catamenia had not been deranged, and she was passing through this crisis when the hemorrhage first came on. During her illness she complained of a little tenderness over the epigastrium.

When a child she had several small aneurisms by anastomosis in different parts of the body, and in talking over the case the thought struck us whether such condition of the capillary vessels of the fibrous layer of the mucous membrane might not have given rise to the lesion.

The hemorrhages in this case were worthy of note. They each came in a gush, and then ceased spontaneously, none recurred in less than forty-eight hours, and others had a much longer interval; no blood could ever be detected as having passed by the bowels. This probably is important in a diagnostic point of view in showing the blood to be from a comparatively large vessel and not capillary; the loss of blood depressing the circulation and for the time stopping the hemorrhage. Had the artery in this case been entirely instead of partially divided, probably the first hemorrhage would have been the last.

This case shows that gastric ulcer may exist without giving rise to any signs, while in other cases it occasions the most alarming symptoms, and the most protracted and cruel suffering.

Hyposulphite and Bisulphite of Soda in Intermittent Fever. By JOHN P. LITTLE, M. D., of Richmond, Va.

For some four years past I have been using the hyposulphite and also the bisulphite of soda as a substitute for quinia in the treatment of intermittent and remittent fevers.

It was first used as a febrifuge in measles, scarlet fever, and similar affections; accidentally its value in fevers of a malarious origin was discovered, and I at once gave it a thorough trial.

Intermittent forms of fever prevailed very extensively immediately after

the war; and as quinia generally failed to give relief, I made free and frequent use of this remedy and with marked good effect.

I have used it in my own case; quinia had failed in removing my fever, although it had succeeded in producing an intense headache; the hyposulphite speedily relieved me.

For an adult the dose is from ten to twenty grains every three or four hours. I have given thirty grains every two hours in cases of high fever. Dissolve each dose in a wineglassful of water. As it is a mild laxative there is no necessity for the use of purgative medicine. Of the two salts, I consider the bisulphite the better in its effects.

Labour with Discharge of an Unusual Quantity of Liquor Amnii. By G. M. D. HALL, M. D., Milesburg, Pa.

About noon, March 1st, 1868, I was called to see a very large, muscular woman, æt. about forty. On examination found the os firm and rigid. Left her for a season to attend to other pressing calls, and upon my return (about one hour subsequently), patient was suffering severe labour pains. On examination during the absence of a pain, found the vertex presenting, os dilating; discovered at the time no abnormal condition of the parts. Labour continued with violence for about three-quarters of an hour longer, at which time the patient exclaimed, "There must be something wrong." On examination during a pain found the bag of waters exceedingly large, and at this time no trace of the child. I at once attempted to rupture the membranes, which was difficult, owing to their extreme toughness, but at last, after repeated attempts, I succeeded, when an instantaneous gush of an inordinate amount of liquor amnii took place and with such force as to sweep the child out with it, and as far away from the mother as the umbilical cord would allow, drenching the woman completely from head to foot, saturating the entire bed and clothing, running through on to the floor. The amount could not well be calculated. The child at first was motionless, but after a minute or two of the ordinary manipulations it uttered a feeble cry. On the face was an eruption resembling rupia. Child died of jaundice three weeks after delivery.

Addendum to Dr. G. C. Blackman's article On Abscess in Bone.—

In my paper "On Certain Points connected with the Pathology and Treatment of Abscess in Bone," published in the October number of this Journal, I attempted to show that Sir Benjamin Brodie had described the chronic sinuous, as well as the circumscribed abscess of bone. The following extract from a clinical lecture on "Abscess of the Tibia," delivered at St. George's Hospital, and published in the *London Lancet*, vol. 25, p. 484 (Dec. 21st, 1833), should have been incorporated with the extracts which I made from the works of Sir Benjamin. In this lecture, at p. 485, he thus remarks:—

"Acute inflammation of the tibia may occur as well as chronic inflammation of that bone, and we know not whether it commences in the bone, the medullary membrane, or the periosteum, as, after death, or an operation, the whole mass appears amalgamated into one diseased structure. Sometimes, at an early period of the disease, the acute inflammation may be subdued by medicine. The pain and fever abate, the œdema of the leg subsides, and the periosteum becomes thinner, but the leg appears larger, owing to ossific portions of bone being deposited on the periosteum during the period of acute inflammation. This is certainly an inconvenience, but not a permanent one, for in the course of one or two years, the extra deposit of bone becomes absorbed, and

the tibia is reduced to its natural size. In this manner then the acute inflammation may terminate. Sometimes, however, the inflammation of the medullary membrane proceeds to the formation of pus, and ulceration and abscess advance through the shell of the old and new bone. After a time these burst and discharge matter. Sinuses will then form in different parts, leading down to a central ulcerated cavity in the bone, which may be dead. Cases, however, sometimes occur, in which there is no dead bone, and then granulations spring up and close the sinuses, and the case terminates without necessity for an operation. It may be, however, that an operation is required in cases where there is not a free discharge for the matter. Cut down to the periosteum, peel it off with your fingers, and apply the crown of the trephine near one of the sinuses. If you introduce a bent probe, you will frequently find a longitudinal sinus running in the direction of the bone. This you must lay open, and dress it to the bottom with dry lint. Granulations will then spring up and it will heal. There may be some slight exfoliation of bone afterwards. Sometimes, when you can feel no dead bone, you may detect a small portion in the sinus, sufficient to keep up the irritation and inflammation of the bone."

Cincinnati, Oct. 29, 1869.

Trichiniasis. By STOCKTON HOUGH, M. D., Resident Physician, Philadelphia Hospital.

Since my report of the two cases of trichiniasis in the number of this Journal for April last, I have detected two more, and am inclined to believe that these entozoa infest the human muscles much more frequently than is generally supposed, and that they may be present in numbers ranging from six to hundreds of millions.

I am *positive* that I should not have detected the last three cases, had I not discovered the *first* one. Even that was not suspected to be an abnormal condition of the muscles by two of the physicians whose attention was particularly asked in regard to the appearance presented by the muscles. One called them air-bubbles under the fascia, and the other believed the appearance to be due to the cut ends of the fibres of the muscle dried.

Unless the trichinæ are very numerous, they will not be detected by one who has never seen them in their encysted state in the muscle, and even then they must often escape observation where their presence is not suspected.

Delivery—the Mother suffering from Prodromata of Measles; the Disease developed in both Mother and Infant on the succeeding day. By ISAAC SMITH, M. D., of Fall River, Mass.

Sept. 7th, 1869, was called to Mrs. T., æt. 25, near her term of pregnancy; waters had been discharged twelve hours previously. Five years before, she had been delivered of twins, both of whom had recently suffered from measles. Mrs. T. had some prodromata, as coryza, of the same disease, suffused eyes, cough, &c., and I thought it advisable that delivery should be effected early. This was accomplished by the administration of ergot. The child was asphyxiated when born, but was resuscitated by Marshall Hall's ready method. On my visit the next morning I found both mother and child completely marked with measles.

DOMESTIC SUMMARY.

Experiments with Chloral.—Dr. HASKET DERBY has made some experiments at the Eye and Ear Infirmary with chloral hydrates, manufactured in Boston.

"The doses given varied from thirty to seventy-five grains (two to five grammes). Thirty grains produced no sensible effect.

"In two cases where forty-five grains had been given, the pulse fell in half an hour from 80 to 70 in one case, from 96 to 84 in the other, drowsiness in either case coming on in a quarter of an hour, followed by natural sleep, which began forty-five minutes after taking the drug. Sleep continued in the first case for two and a half hours without waking, and an hour and a half at intervals afterwards.

"In the other case, with the same amount, sleep only lasted one and a quarter hours.

"In two more cases sixty grains were given, the pulse falling in one from 120 to 90, in the other from 90 to 60 in about half an hour, with increasing drowsiness. In the first case the patient did not go to sleep for two hours, and then only slept one and one-fourth hours. Whereas, the other fell asleep in an hour, sleeping heavily two hours, and at intervals for from two to three hours more.

"In another case seventy-five grains were given, the pulse falling from 125 to 100 in half an hour, sleep then coming on and continuing for four hours. It was, however, somewhat interrupted, and the patient was roused and made to answer questions without much difficulty.

"In no instance did sleep come on in less than half an hour after taking the drug. Two or three of the patients complained, on waking, of headache, lasting from one to three or four hours; but otherwise they seemed to experience no ill effects. Appetites good.

"The results obtained with this American preparation will be seen not to harmonize with those of Liebreich, who claims a much greater hypnotic power, having with from one and a half to three and a half grammes (twenty-five to thirty grains) produced sleep which lasted from five to fifteen hours. He also considers chloral an anæsthetic of some power, though inferior to chloroform and ether. Demarquay, on the other hand, in a recent report to the French Academy of Sciences, states, as the result of a series of experiments on animals and men, that he considers chloral as no anæsthetic at all, as the skin is sensitive, no matter how great the intensity of the sleep. He finds it, however, the most rapid of hypnotics."

Dr. D. subsequently gave chloral with more positive results: "One patient, who had been suffering great pain from an ulcer of the cornea, was given gr. lx. early in the evening. The pain was relieved in the course of half an hour, but the patient became somewhat delirious, and, being missed from the ward, was found wandering about alone in the upper stories of the building. On being brought back to his bed he at once went to sleep, passed the night quietly, and continued in a drowsy state all the next day. *He exhibited marked cutaneous anæsthesia*, as did also a female patient who took the same dose. Forty-five grains were given in a case of iritis, attended with severe pain, at 1 A. M. The patient, a woman of 60, went at once to sleep, and awoke the next morning free from pain, but complaining of headache."—*Boston Med. and Surg. Journ.*, Dec. 2, 1869.

Physiological Action of Bromide of Potassium and Ammonium.—Dr. ROBERT AMORY in a paper read before the Massachusetts Medical Society, from experiments performed on man and the lower animals, deduces the following conclusions:—

I. Bromide of potassium is easily absorbed by the mucous membrane wherever they are placed in contact.

II. This drug is *easily* absorbed by the skin, provided the water in which it is dissolved is below the temperature of 75° F. If the temperature is above 96° F., it is not absorbed.

III. The elimination is conducted by the skin and kidneys; as the saliva is a secretion, its presence in this fluid is not a proof of its elimination.

IV. In therapeutical doses bromide of potassium is not eliminated by the intestines or lungs.

V. Bromide of potassium passes out of the system without decomposition.

As most of the chemical transformation of drugs takes place, according to Bernard, in the laboratory of the kidneys, Dr. Bills' theory in regard to the interchange between chlorine and bromine in the blood, probably, is erroneous. If there is an interchange, it is in the kidneys, or outside of the body (in other words), that the transformation must occur.

VI. The effects of the drug are produced by its direct action upon the bloodvessels or the vaso-motor system which control the contraction of these vessels, which explanation may account for all the physiological or therapeutical conditions brought about by the exhibition of this drug.

VII. There is probably no different or opposing action in proportion to the dose administered, which cannot be said of all drugs. The larger the dose the more intense and the longer the action upon the vaso-motor system.

VIII. Its action upon the general nervous system is secondary, and dependent upon that of the vaso-motor nerves. That it affects certain parts where there may be a determination of blood is not contrary to the known laws of physiology. Lack of healthy resistance to disturbing influences allows the bloodvessels to be dilated, and consequently discharged. The presence of this drug stirs up the opposing influence which contracts these vessels. This influence would be exerted upon the diseased portion of the system more powerfully than upon the healthy portion.

IX. Bromide of ammonium in *almost* every respect has the same action as bromide of potassium.

Barton's Operation for Bony Anchylosis of Knee-Joint.—By GEORGE C. BLACKMAN, M. D., Prof. of Surg. During a recent professional visit to Eaton, O., my friend Dr. A. H. Stevens, had the kindness to show me a young gentleman on whom I performed the above operation in April, 1861. The result has been most gratifying. The leg is very slightly flexed, and the patient walks with a gait nearly natural. In looking over the records of the old St. John's Hospital, I find a report of the case carefully drawn up by Dr. Thomas Macmillan, a well-known surgeon of the regular army, and who, at that time, was one of the resident physicians of the institution. We copy the more important details of this report:—

"Benjamin F. Stark, æt. 20, farmer, admitted April 1st, 1861. Eleven years ago cut his right knee with an axe, making a wound seven inches long and a quarter of an inch in depth, on the inner side of the knee. This was followed by great inflammation, and when it subsided the joint was stiff and the limb straight. Some months afterwards the leg began gradually to become flexed, and finally became immovably fixed at a point which left the heel about eight inches from the floor, or nearly at a right angle. On the 2d of April, the patient being fully under the influence of chloroform, Prof. B. attempted with great force, but unsuccessfully, to break up the adhesions. In this he was assisted by Drs. Tripler and Foster. On the 5th of April, assisted by the same gentlemen, Prof. B. proceeded to perform Barton's operation of exsecting a wedge-shaped piece of bone. A semilunar incision was made over the front part of the thigh, commencing about two and one-half or three inches above the condyles. The soft parts were then detached and reflected so as to expose the bone. The saw was now applied so as to remove a wedge-shaped piece of the femur, measuring on its anterior surface about one and three-quarters of an inch in extent. At the apex of the wedge, on the posterior surface the bone was not completely divided, a few lines in thickness having been left. The patella being very prominent, the greater portion was removed. The hemorrhage was very trifling, no vessel requiring a ligature. The flap having been replaced and secured with stitches, the limb was placed in a McIntyre's splint, the angle of which being that of the limb before the operation. The patient rallied well from the operation, and the following night was passed comfortably under the influence of a quarter of grain of sulph. morphia. The next morning he suffered considerable pain, and there was some oozing of blood from the corners of the wound, which was checked by the application of cold. From the 6th to the 13th of April he suffered at times some pain in the limb, which, however, was soon relieved by small doses of morphia and mild cathartics. On

the 16th there was a profuse discharge of pus from the inner angle of the wound. This was materially diminished by the 19th, when moderate extension was made, which produced considerable uneasiness along the lower and posterior portion of the thigh. This soon subsided, and from day to day gradual extension was continued. Until the 26th of the month patient occasionally suffered from twitching of the limb, which seemed to be bent outward at the point of operation. On the 27th, the patient being under the influence of chloroform, the splint was removed while the limb was straightened, after which it was reapplied. May 17th, a piece of bone of irregular shape, and about an inch in length, was removed from the outer side of the leg, and on the 25th a second piece of about the same size was extracted. From this time the healing of the wound was rapid, and, as on the 1st of July, the openings were all closed, and the limb perfectly solid, he was discharged cured."—*Western Journ. Med.*, Aug. 1869.

Spontaneous and Artificial Delivery of the Child in Face Presentations, with the Chin Posteriorly.—The *New York Med. Journal* (Nov. 1869) contains a paper on this subject by Dr. ISAAC E. TAYLOR, Emeritus Prof. of Obstetrics in Bellevue Hospital Med. College. The author lays down the following propositions:—

1. That mento-posterior positions of the face are the most frequent; that spontaneous delivery may be accomplished as easily, readily, and safely, as in mento-anterior cases; that rotation of the chin forward to the pubes can occur even though the face has descended into the excavation, and sometimes just as the child appears to be born.

2. That these cases may be delivered spontaneously—by cephalic version in the pelvis, and by the passing also of the child's face over the perineum, the chin appearing first. In other cases, the occiput may emerge from under the pubes first.

3. That if rotation of the chin anteriorly cannot be accomplished naturally, nor by artificial resources, I propose first the *division of the perineum laterally*, on whichever side the chin presents, and before craniotomy is performed.

4. That should the natural powers of the uterus not effect delivery even after division of the perineum, the application of the long *straight* forceps should be resorted to in preference to the curved, and the direction of the traction should be made directly downward and backward.

Persistent Priapism.—Dr. R. B. S. HARGIS, relates (*New Orleans Journ. Med.*, July, 1869), a case of this which was relieved by bromide of potassium in doses of fifteen grains every two hours, given in solution. The patient had a second attack five days subsequently, and was relieved by the same medicine.

Elephantiasis Arabum; Ligature of Main Artery; Compression and Elevation of Affected Member.—Dr. L. BAUER reports (*St. Louis Med. and Surg. Journ.*, Nov. 1869) a case of this. The subject of it was a man whose scrotum and left leg were affected with elephantiasis. Dr. B. placed a ligature on the femoral artery immediately below the profunda, June 16th. Collateral circulation being well established in two days a compressive bandage was applied to the limb. At the last report, three months subsequent to the operation, it is stated that the patient enjoyed unexceptionable health, while his local trouble has been steadily decreasing. The ligation of the artery, in this case, the operator says, has been most beneficial in reducing the size of the affected extremity. But he admits that the limb has not returned to its normal state. "I would ascribe," says Dr. B., "less importance to its [the limb] present defects in contour and shape, but the still remaining changes in the consistence of the integuments and muscles must be looked upon with apprehension and doubt as to the permanency of the improvement."

Treatment of Aneurism by Gradual Compression.—Dr. GURDON BUCK presented to the New York Pathological Society two specimens of aneurism—one of the axillary artery, and a double one of the popliteal—with a view of show-

ing the condition of their contents in reference to two different modes of treatment.

The case of popliteal aneurism was of recent origin, and occurred in a patient over sixty years of age, of a leuco-phlegmatic temperament, and of a cachectic habit. The axillary aneurism occurred in a patient thirty-five years of age, of apparently good constitution; and in his case, also, the appearance of the disease dated back only a few months. In neither case was there a traumatic origin. Both of the patients died within a day of each other—one on the twentieth, and the other on the twenty-first. In both cases the symptoms supervening were those of pyæmia; in one there being metastatic abscesses in the lungs, in the other the inflammation confined itself chiefly to the parts in the neighbourhood of the operation.

In the case of the popliteal aneurism, the method of treatment was the application of a ligature by an instrument devised for the purpose, with the intention of compressing the artery partially during a definite period, which was thirty-six hours, and completely during twelve hours, and then removing the ligature. The ligature was passed through a double canula, and tightened by means of a miniature tourniquet, a smooth plate at the extremity of the canula resting upon the artery. The vessel was exposed, and the ligature passed round it, and then tightened by successive half turns, deliberately made, while an assistant carefully observed the effect upon the tumour. At the moment when pulsation ceased, the constriction was let up. As the result, the sac soon lost its plumpness. After this the ligature was relaxed by half turns up to the moment when the pulsation returned in the aneurism. At that point the instrument was left and steadied in the wound by appropriate dressings. When first left, the outlines of the tumour could not be distinguished, although pulsation was feeble within it. In six hours it again assumed its plumpness, was well defined, the pulsation more distinct, and the tumour firm and more resisting. Before the expiration of the first period of six hours of incomplete compression, the constriction was increased, and all the time the tumour grew more firm and harder. At the end of thirty-six hours the instrument was tightened, and left for twelve hours, and when finally removed there was no pulsation whatever, and the tumour was hard and firm.

This patient survived twenty days. Shortly after the operation, secondary hemorrhage occurred at the seat of the wound, making it necessary to cut down and apply a ligature above and below the point. The accident was perhaps explained by what was found at the post-mortem—namely, a second aneurism the size of a walnut, situated very near the bone, and higher up than the one recognized during life. Both of these sacs were, however, completely filled with clots.

In the case of the axillary aneurism, the Hunterian method was employed, and the ligature was applied in the usual way. The patient progressed favourably for fifteen days, when the ligature came away, and then he was seized with a severe rigor, and died of pyæmia a week afterwards. The centre of the sac contained some syrupy blood; but along its periphery there was a distinct and firm fibrinous deposit, arranged in layers. On the distal side of the sac there was no plug; but this was explained by the presence of branches of considerable size given off in the vicinity.

Dr. Buck then remarked upon the practicability of carrying out the idea of gradual compression by other means than those employed, advocating the finger as the most proper instrument for the purpose.—*Med. Record*, Dec. 15, 1869.

Hypodermic Use of Ergot for Post Partum Hemorrhage.—Dr. F. D. LENTE suggests (*Medical Record*, Nov. 15th, 1869) the hypodermic injection of half a drachm of Squibb's extract of ergot, repeated as often as necessary, until the specific effects of the remedy is obtained, as a means of arresting post-partum hemorrhage. He has himself tried it in one case, but as the hemorrhage had previously ceased in a great measure, the result was not conclusive as to the efficacy of the remedy.

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eases.—*Western Journ. of Medicine*, Feb. 1869.

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predecessors.—*Pacific Med. and Surg. Journal*,
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FOR APRIL 1870.

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Contributors who wish their articles to appear in the next number, should forward them before the 1st of May.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

Communications postponed for want of room shall receive early attention.

The following works have been received:—

Die Criminalistische Zurechnungsfähigkeit. Von J. VON ROENNE, Königl. Kreisrichter. Berlin, 1870.

Versuche über Hornhaut-entzündung. Von WILLIAM F. NORRIS und S. STRICKER. Wien, 1869.

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Obstetric Aphorisms for the Use of Students commencing Midwifery Practice. By JOSEPH GRIFFITHS SWAYNE, M.D., Lect. on Obstetric Med. at the Bristol Med. School. From the fourth revised English edition, with additions by EDWARD R. HUTCHINS, M.D. Philadelphia: Henry C. Lea, 1870.

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The Journal of the Gynæcological Society of Boston. Vol. I. July to December, 1869. Boston: James Campbell.

Remarks on Strabismus. By EDWARD G. IRVING, M. D.

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Comparison of the Mortality from Disease in Armies with that of Men of Military Ages in Civil Life, showing the Groups of Diseases chiefly concerned in Causing the Excess of Mortality in Armies. By A. NEWMAN, M. D. Leavenworth, 1869.

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By J. AITKIN MEIGS, M. D., Prof. of the Institutes of Medicine, one of the Physicians to the Pennsylvania Hospital, etc. etc. Philadelphia, 1870.

Special Report of the Chief of Bureau of Medicine and Surgery (U. S. N.) on the Difficulty of Officering the Medical Corps of the Navy, its Causes, and the Remedy.

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The following Journals have been received in exchange:—

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Archiv für Anatomie, Physiologie, und Wissenschaftliche Medicin. 1869. Nos. 5, 6.

Deutsches Archiv für Klinische Medicin. Sechster Band, Fünftes und Sechstes Heft.

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 The Journal of Cutaneous Medicine. January, 1870.
 The Glasgow Medical Journal. February, 1870.
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 Canada Medical Journal. January, February, 1870.
 The Dominion Medical Journal. December, 1869. January, February, 1870.
 The Boston Medical and Surgical Journal. January, February, March, 1870.
 The New York Medical Journal. January, March, April, 1870.
 The Medical Record. January, February, March, 1870.
 The American Journal of Obstetrics. February, 1870.
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 The Buffalo Medical and Surgical Journal. December, 1869. Jan., Feb., 1870.
 The Journal of Psychological Medicine. January, 1870.
 The Cincinnati Lancet and Observer. January, February, March, 1870.
 The Western Journal of Medicine. December, 1869.
 The American Practitioner. January, February, March, 1870.
 The Saint Louis Medical and Surgical Journal. January, March, 1870.
 The Detroit Review of Medicine and Pharmacy. December, 1869. January, February, March, 1870.
 The Medical Archives. December, 1869. January, February, March, 1870.

We have received in exchange many other American Medical Journals, and regret extremely that we are compelled to omit, from want of room, the usual special acknowledgments of these favours. We trust to be able to do so in our next number.

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THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR APRIL 1870.

ART. I.—*Cases of Aphonia from Paralysis of Intrinsic Muscles of the Larynx. Treatment by External Manipulation of the Organ and Restoration of the Voice in a Single Sitting.* By HENRY K. OLIVER, M.D., Physician to the Massachusetts General Hospital, Boston. (With seven wood-cuts.)

OF the various affections of the larynx, the neuroses have always been among the most interesting, and, since the means of inspecting the interior of the organ in the living subject have been at our command, the paralyses of its intrinsic muscles have excited marked attention. It is now possible to say, with a great degree of precision, what particular muscles are deprived of their power in any case, and thus to classify pathological conditions which were formerly comprehended under the general term, Paralysis of the Glottis.

I purpose suggesting a novel mode of treatment in the form of laryngeal paralysis called, by Mackenzie, "Paralysis of the Adductors of the Vocal Chords;" and by Tobold, "Phonic Paralysis," a form bilateral in character, and dependent, in the majority of cases, upon general debility and hysteria, or other impairment of the nervous system, but sometimes upon emotional influences and a weakened condition of the muscles following laryngitis or the straining of the voice, and more rarely upon rheumatism and other blood diseases.

On laryngoscopic examination, either complete or incomplete paralysis of the cords will be found. In the former case, these ligaments, on attempted phonation, remain widely separated. In the latter case they approach the median line of the glottic aperture to a greater or less extent; they may even come nearly into apposition with each other for the

greater portion of their length, but the vocal processes will not be in contact, and the cartilaginous glottis will not be wholly closed. In some cases the vocal processes will come into apposition with each other, and the cartilaginous glottis will be closed; the parts are then in a position suitable for phonation, but when the air is forced against the cords they are not able to retain their position, but separate without vibrating. At other times the cartilaginous glottis will be partially closed by an incomplete approximation of the arytenoid cartilages, whilst the vocal processes and, of course, the vocal cords, remain separated.

The methods of treatment commonly employed in the affection which has been spoken of, are as follows:—

1st. Galvanism.

2d. The application of stimulating liquids to the interior of the larynx, or the inhalation of stimulating gases.

3d. The “Gymnastic of the Larynx,” suggested by Von Bruns, of Tübingen.¹

4th. The employment of an anæsthetic.

5th. A general course of treatment only, such as change of air, tonics, &c.

It is well known, moreover, that, in this affection, the voice has been suddenly restored under some general excitement or mental impression.

In addition to the methods of treatment above enumerated, I propose that by the external manipulation of the larynx. This method consists chiefly in the compression of the wings of the thyroid cartilage in their posterior and upper part by the thumb and forefinger. Such compression, if practised on the dead larynx, will be found to approximate, to a certain degree, the arytenoid cartilages, and, as a consequence, the vocal cords. These ligaments will also become somewhat tenser. If the compression be made in the living subject, the same approximation and stretching of the cords may be observed by the laryngoscope.

In employing this method in paralysis of the adductors, the patient is instructed to make an effort to produce a sound, like that of *a* or *ah*, or any sound of the voice whatever, while compression of the larynx is being made. The result generally is that, after a little time, a feeble voice-sound is produced, and this is followed shortly after by the full restoration of the voice.

Many of these cases seem to be dependent upon a lack of power to *start the machinery* of the vocal apparatus completely, if the expression

¹ In this method of treatment the patient is asked to produce simple sounds, as of the vowels or diphthongs, while the laryngeal mirror is in position in the pharynx. It has been practised by Von Bruns with some success. Occasionally the voice has been restored in a single sitting, but generally the treatment has extended over a considerable period.

may be allowed. When once started, by any means, the power of keeping up the action is pretty easily afforded. The paralysis seems, therefore, to be of an unusual character; indeed, the many well-known instances of sudden restoration of the voice, either unaided by any local treatment, or induced by direct stimulus¹ to the interior of the larynx, show a condition quite peculiar to the laryngeal muscles.

It has come to the knowledge of every physician, probably, that quacks have succeeded in restoring the voice, immediately, by grasping the throat and producing violent compression. The recovery, under such circumstances, may have been owing, in a measure, to the mental impression upon the patient, but it may have been aided by such an adaptation of the parts of the larynx as I have described, a condition of things unappreciated by the operator, but leading none the less to a successful result.

As an aid to this manipulation of the larynx, I have taken advantage of the valvular nature of the vocal cords, an anatomical fact first, so far as I am aware, demonstrated by John Wyllie, M. D., M.R.C.S., in a prize dissertation entitled "Observations on the Physiology of the Larynx," published in the *Edinburgh Medical Journal*, vol. xii. (September, 1866). Reference to this subject will make a digression necessary.

Dr. Wyllie shows that the vocal cords, when approximated, constitute a valve opening outwards, while the false cords form a valve opening inwards. In the complete glottic closure, when inspiration and expiration are impossible, the former act is prevented by the vocal cords, and the latter by the false cords. He observes, after describing his experiments upon the larynx:—

"The conclusion to be derived from these experiments is obvious. There is within the larynx a double valve which is capable of controlling both the exit and entrance of air. The plan found so commonly throughout the body in such structures, in the aortic and ileo-cæcal orifices, and in the course of the veins, holds good here likewise. In the upper half the resemblance is most obvious. Comparing it with the aortic valve, we find the representatives of the sinuses of Valsalva in the well-marked ventricles of Morgagni, whilst the cusps are reproduced in the two folds of mucous membrane, whose free edges are known as the false vocal cords.

"The same design may be traced in the lower half of the valve. When the true vocal ligaments are brought into apposition, no deep sinus is found on either side, but their upper surfaces form together a broad flattened plane, slightly hollowed out exterior to the margins of the rima glottidis, and this arrangement, owing to the greater density and mobility of the parts, is found to act as efficiently as the well-marked ventricles and cusps of the upper valve."

A longitudinal section of the larynx, through the middle of the vocal cords, shows this valvular arrangement clearly. The annexed Fig. 1 is an outline of the representation given by Dr. Wyllie. A is the vocal cord; B the false cord; c the wedge-shaped space below the vocal cord; D the wedge-shaped space above the false cords; E the ventricle of Morgagni.

¹ Either of a single shock of the galvanic current, or the local contact of the uncharged sponge.

Annexed, also, are outlines of the interior of the larynx, taken from sections of gypsum casts.¹ In the larynx from which the outline Fig. 2

Fig. 1.

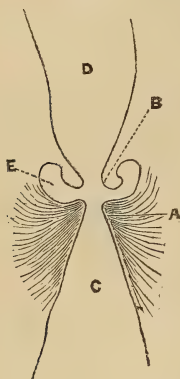


Fig. 2.



was taken, the vocal cords and the false cords were brought slightly out from the side of the organ. In that from which Fig. 3 was taken the ligaments were brought into apposition, while in Fig. 4 the vocal cords, only, were approximated.

Fig. 3.



Fig. 4.



It will readily be seen that, on account of the wedge-shaped space below the vocal cords, the expired current of air can easily force the vocal cords apart, even when they are tightly closed, but that it will find effectual resistance at the false cords, where the ventricles will be inflated and these

¹ The following method of preparing outlines of the interior of the larynx occurred to me, and the results have been quite satisfactory:—

A cast in gypsum of the interior is first made; this is then painted black, and, when dry, is set upright in a box an inch or two square, and of a height corresponding to the length of the cast, and into the box is poured liquid gypsum. After hardening, a section of the mass is made with a watch-spring saw. The outline of the interior is thus clearly represented by the line of black; this line is, in fact, an exact counterpart of the mucous membrane in section.

folds be brought firmly into apposition. In the inverse action, namely, in inspiration, the air can easily wedge apart the false cords, while the vocal cords become the resisting bodies.

In cases of bilateral paralysis of the abductors of the vocal cords, viz., the posterior crico-arytenoid muscles, the approximation of the cords in inspiration, and their separation in expiration, have been frequently noticed by the laryngoscope, and, so well do these ligaments act the part of valves, under such circumstances, that suffocation is often only averted by the performance of tracheotomy. The noisy character of inspiration and the noiseless character of expiration are also remarked in these cases.¹

It is this action of the *vocal cords* only which concerns us now.

In regard to the vibratory function of the vocal cords by the inspired current of air, the following remarks are submitted: While it is true that the pressure of this current tends to bring the cords more firmly together when once they are in contact and the current is suddenly interrupted, yet the inflowing column occasions the vibration of the ligaments when they are more or less approximated, but not in intimate contact. Again, when the vocal cords are not sufficiently approximated to oppose a resistance to the air capable of exciting vibration, such an approximation may, by virtue of their valvular character already alluded to, be obtained by making strong and sudden inspirations: provided, however, that they are previously brought together somewhat, so as to become a material obstacle to the passage of air. In other words, there is a degree of approximation of the cords insufficient for their vibration, but sufficient for the offering of resistance to the air; and the form of the obstructing bodies is such that the air tends to approximate them still more rather than to separate them, and that to a degree sufficient for vibratory action. In this movement of approximation the air acts the same part in relation to the cords that the blood does in relation to the aortic valves, except as regards the degree of closure. This action of the vocal cords with forced inspiration during compression of the thyroid cartilage, as described, I have verified by auto-laryngoscopic observations. The degree of approximation necessary for inducing vibration with inspiration seems to be considerably less than that required with expiration—a fact which goes to confirm the assertion that the form of the cords is such as to offer a greater resistance to the inflowing than to the outflowing column of air.²

¹ In the pathological conditions which are accompanied by œdema of the larynx, in which the ary-epiglottidean fold, which forms the superior aperture of the larynx, is often the most affected, the swollen parts form a third valve opening outwards. A characteristic symptom of this affection, when the false cords are but little implicated, is difficulty of inspiration, expiration being comparatively easy.

² In hurried breathing the vocal cords may often be observed to move slightly outwards in inspiration, thus enlarging the glottic aperture, while they return to their former position in expiration. A reasonable explanation of this

Now, in the method of treatment I have suggested, a degree of approximation in the cords sufficient for decided resistance to the air is to be obtained by the compression of the wings of the thyroid cartilage, and a still further approximation, sufficient for vibration of these ligaments, by making strong and sudden inspirations. In the two most obstinate cases recorded below, therefore, the patients were instructed to attempt to make a sound by strong and sudden inspirations during compression of the larynx. The efforts were successful, and in both instances a voice-sound could be produced by inspiration before any could be made by expiration in the natural way. When, however, the vibration of the cords was once excited, their action in the normal way followed in a short time.

The cases to be presented are six in number, comprising all in which I have employed this method. None are instances of complete paralysis, and I have not had an opportunity of testing the treatment upon this extreme form. I do not, however, doubt its efficacy, inasmuch as these cases often yield to a single application of galvanism.

CASE I.—Mrs. C., widow, aged 73 years, came to me in November, 1867. Her general health had always been good. In 1857 she lost her voice suddenly, no cause therefor being apparent. The voice returned of itself three months afterwards, its reappearance being also abrupt.

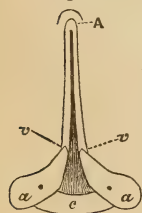
In November, 1866, while absent from home, she had typhoid fever. Some weeks afterwards she lost her voice suddenly again. At this time she had not fully recovered her strength, but was sufficiently strong to return to her place of residence. A second time the voice returned of itself, and in about four weeks.

Six months before visiting me aphonia occurred again, and she had not spoken a word since.

For her age, Mrs. C. seemed in excellent general health and condition, although she thought she had not been quite as strong since the fever as before. She spoke only in a whisper, and had become quite discouraged about recovering the voice again at her age: indeed, she had come to consult me with great unwillingness on her part and only on the urgent advice of friends.

On examination with the laryngoscope, the cords were seen to approach each other equally well on attempted

Fig. 5.



A is the anterior insertion of the vocal cords; a, a, are the arytenoid cartilages; v, v, the vocal processes; c, arytenoid commissure.

movement would seem to be the following: Inspiration is the result of strong muscular action, and the air consequently enters the passages with considerable velocity. Expiration is, however, principally a passive act, being the result of a relaxation of muscular action and the contraction of elastic tissues, and there is, consequently, less power in the current of air. We might, therefore, expect to find, as we do, a temporary enlargement of the glottic aperture with the inspiratory act. But it is not unreasonable to suppose that this movement of the cords is a consequence of their peculiar form, a form, by the way, necessary to the best phonetic results. These ligaments are, namely, removed during inspiration from a position where, otherwise, the current of air would tend to make them approximate, and so obstruct respiration.

phonation, but to a certain extent only, the vocal processes not coming in contact, and the cartilaginous glottis remaining open (Fig. 5.)¹ No other abnormal appearances of any kind were discovered in the larynx.

It being evident that the difficulty was paralysis of the adductors, treatment by manipulation was determined upon, but on account of the mental depression, to which allusion has been made, and which was really quite marked, it was thought best to endeavour previously to excite the patient's interest, and inspire some degree of hope, by a pretended use of electricity. A very feeble electric current was consequently passed through the neck for a few seconds, with no effect upon the voice. The wings of the thyroid cartilage were then compressed, and the patient was instructed to endeavour to make a sound. In the course of perhaps five minutes a sound was produced, and she immediately after spoke in a sufficiently strong voice, which continued after the removal of the compression.

The day following Mrs. C. returned to my office and was speaking in a loud, strong tone. Since this second visit I have not seen her, but members of her family have informed me that she has continued to retain the voice.

Remarks.—Although the electric current was employed in this case there is no reason for believing that it had the slightest influence in the restoration of the voice, for while a moderately strong current passed from the interior to the exterior of the larynx is often the means of curing the aphonia at once, yet the treatment by electricity externally is successful only after its employment for a considerable time—days and even weeks being required.

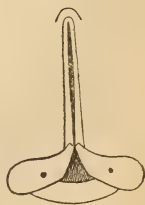
CASE II.—Mrs. —, aged forty, was brought to me by Dr. Joseph Garland, of Gloucester, Mass., November 22, 1867. Her health had been pretty good till ten years before, when she had uterine difficulty lasting two years. At one time, as Dr. Garland reported, marked ulceration and hypertrophy of the neck of the womb existed. Four years subsequently, she again had a similar trouble, her health again became affected and she had been feeble ever since. Amenorrhœa had existed for some months. Some slight hysterical manifestations had been noticed. Two years previously to her consulting me aphonia came on suddenly, and although she thought she had been able to make a single sound above a whisper, once or twice since, there had been no real restoration of the voice.

Her appearance was characteristic of a general and marked want of vitality. On making very light pressure along the spine, tenderness was complained of, at various points.

On examination with the laryngoscope the larynx had a perfectly healthy look. On attempted phonation, the ligamentous glottis closed, the vocal processes being in apposition, but the cartilaginous glottis remained open (Fig. 6).

Manipulation of the larynx was at once resorted to, firm pressure being made upon the wings of the thyroid cartilage, as in the previous case, and the patient was asked to count *one, two, three.*

Fig. 6.



¹ This and the succeeding figures are nearly after Tobold.

After a trial of a minute or two merely, a voice-sound was heard, and almost immediately afterwards every attempt was successful, so that when the compression was discontinued she spoke in a moderately loud tone. After no doubt existed that the voice was really restored, the patient was dismissed with instructions to read aloud daily and cautions to repress any tendency to whisper. Tonics, etc. were also advised.

A week or two after, Dr. Garland informed me personally that the voice was still good. Subsequently, I supposed that the case was doing well, since I heard nothing to the contrary, but, in reply to a letter of inquiry in the spring of 1869, Dr. G. wrote that the voice gradually became weaker during the winter of 1867 and 1868, until complete aphonia again occurred. A second visit from the patient was requested, but I have not seen her since.

Remarks.—The voice was not permanently restored in this case, but this fact does not invalidate the efficacy of the method of treatment employed. The relapse would undoubtedly have occurred whatever method had been selected, and was due to the want of vitality in the general system. It is but just to add that Dr. Garland seems to have done all that was possible to improve the condition of the patient after the temporary restoration of the voice; and in addition to the general course of treatment, he employed the inhalation of the spray of stimulating solutions, and electricity.

CASE III.—Miss W.—, seamstress, aged 31, was brought to me by Dr. D. McB. Thaxter, of South Boston, June 17, 1868. Her health had never been very good; she had always been "subject to lung troubles;" had also had menstrual difficulties, the menses having been sometimes absent for six months at a time. In the fall of 1858, she had lung fever. In the spring of 1859, she contracted a "cold," was hoarse and had some indefinite pulmonary symptoms. At this time her voice left her and was absent three months, returning suddenly. In March, 1860, she had an attack of "congestion of the lungs." Towards the latter part of this illness she lost her voice again, this time suddenly, and she had not spoken a loud word since then, a period of eight years.

On several occasions in the two years previous, Miss W. had raised blood in slight amount, mixed with "phlegm;" at these times there was no menstrual irregularity. Her general health had, however, rather improved in these two years, and she had gained in flesh and strength. Of late, too, she had had less menstrual disturbance. On the other hand, during the last four months she had had more cough than formerly, with expectoration of varied character and some pain in upper part of chest.

At the time of the consultation, Miss W. had a delicate look, but was in pretty good flesh. Appetite, good; pulse, 80. She articulated in a smooth whisper, and with all her efforts, a voice-sound could not be produced. Tenderness was found at various points in the length of the spine, even when the pressure was very light. General tenderness of the larynx on pressure was also complained of. An examination of the lungs revealed no definite sign of disease of any kind. With the laryngoscope no inflammatory or other abnormal appearances were discovered in the larynx. On attempted phonation, however, complete closure of the glottis did not take place. The shape of the glottic aperture varied. At one time the vocal

cords would be approximated for the greater part of their length, the vocal processes remaining somewhat separated, and the cartilaginous glottis being open. The appearance then was much as represented in Fig. 5, Case I. At another time the arytenoid cartilages would be approximated in such a way that the posterior portion of the cartilaginous glottis was closed, while the vocal processes were far apart and the ligamentous glottis, consequently, open (Fig. 7).

Notwithstanding the aphonia had existed for so long a period, I determined to try the effect of compressing the thyroid cartilage. This was done, with simultaneous attempts at the production of sound on the part of the patient. In ten or fifteen minutes (including intervals of respite), a voice-sound was heard, although weak in character. After becoming convinced by repeated trials that the cords were vibrating, and having been obliged to exercise considerable pressure upon the larynx, I desisted from further treatment for the day, but urged the patient to endeavour to continue speaking aloud. The following day she again visited me. The larynx was somewhat more tender, the result, perhaps, of the compression. She could, however, speak in a moderately loud tone and no further manipulation of the larynx was made. There was a tendency to whisper at every few words, while a necessity existed for taking breath frequently, the result of the feeble approximation of the cords which allowed the air to escape too freely. Daily exercises in reading aloud, open air exercise, and tonics were advised. Meanwhile she visited me daily for a week. The tendency to whisper and to take breath frequently, diminished steadily, while the voice became stronger. In the latter part of July she left Boston for her native town in New Hampshire for the improvement of the general health, the voice continuing good.



In February, 1869, I received a letter from Miss W., in which she says, "My voice is comparatively strong. * * I can sing a little. My cough is still troublesome and there is some weakness through the lungs and shoulders, but I ought not to complain when I compare my condition with that of a year ago. Society then was a dread to me, now it is a pleasure."

CASE IV.—John P., aged 13, was brought to me by his parents Dec. 23, 1868. They reported that he had had fair general health, but had always been a "nervous and very uneasy boy." Three months before, he had lost his voice suddenly while at school, and had since then made no sound above a whisper. For a few days previous to the aphonia he had a slight "cold," but no hoarseness. Treatment of various kinds had been employed, by the family physician and others, directed to a supposed inflammatory condition of the larynx.

The boy had a general feeble look and exhibited decided marks of nervousness. On being shown the laryngeal mirror and requested to examine it, he first hesitated to touch it, and then laughed and cried alternately. Laryngoscopy was nevertheless easy. No inflammatory appearances were observed in the larynx. On attempted phonation, the vocal cords were approximated in the normal way, but were immediately forced apart again by the current of air, without vibrating. The left cord seemed to yield somewhat more readily than the right.

Manipulation was resorted to, and a voice-sound was produced in a few minutes, and full restoration of the voice within fifteen minutes. A

disposition to whisper the first word of each sentence existed during his stay at my office, but he was made, in each case, to commence the sentence anew, and this tendency constantly lessened. Tonics, &c., were advised, and his parents were counselled to remove him from school for a time.

This patient I have seen once since, and have heard from him many times. His general health is much improved, and the restoration of the voice has been permanent.

CASE V.—Adeline L., aged 14 years, was brought to me by her mother, Feb. 13th, 1869. She had always been in good health. Had menstruated once only, and that five weeks previously. Never manifested hysterical symptoms. In April, 1868, she had a "cold" and was a little hoarse: this passed away gradually in a few days. Two or three days after apparent recovery, her voice left her suddenly and she had not spoken aloud since. She had been obliged to give up school, and had been under medical treatment, but had been told that nothing more could be done to restore the voice.

She appeared to be in good general health. On examination with the laryngoscope, the larynx appeared to be perfectly healthy. On attempted phonation, the vocal cords approached the median line equally, but did not come in contact with each other, and the cartilaginous glottis remained open, the appearance being much as in Fig. 5, Case I. The current of air, moreover, immediately forced the cords apart. There was, therefore, marked weakness of the adducting power, and on account of this circumstance and of the probability, also, that this weakened condition of the muscles was due to the inflammation of the parts which had immediately preceded the aphonia, I anticipated considerable difficulty in restoring the voice, and so expressed myself to the mother. Manipulation of the larynx was, however, immediately begun, with the usual instructions to the patient to attempt to make a sound. For a time her efforts were quite futile, and no sound indicating the vibration of the cords could be heard. It was at this juncture that it occurred to me that advantage might be taken of the valvular character of the cords, to which allusion has been made at some length. She was, therefore, instructed, during compression of the thyroid, to make sudden and strong inspirations, and to endeavour to make the breathing noisy. The inspirations soon disclosed a marked noisy character, the expirations much less so. She was then asked to make a sound, either with inspiration or with expiration. Gradually the inspiratory act seemed to acquire a vocal character, and it was not long before it was certain that the cords were in action. Subsequently, attempts to produce a sound with the expired current of air were successful, the larynx being still compressed, while shortly after the voice was completely restored. She was made to read aloud for some minutes after the recovery of the voice, which became notably stronger as she progressed. There was, however, in conversation, some tendency to whisper occasionally. Her mother was desired to make her read aloud many times daily, and not to allow whispering without reproof.

The whole time occupied in the restoration of the voice was a little short of an hour, including respites. I have seen this patient once or twice since, and have heard from her frequently. The recovery has been permanent.

CASE VI.—A. B., a female domestic, aged 26 years, was brought to me by Dr. O. O. Davis, of North Andover, Mass., Sept. 27th, 1869. Her

general health had been fair, but she had had at times leucorrhœa and dysmenorrhœa, although the monthly periods had been regular. She was reported to be of a nervous temperament, but no hysterical symptoms had ever been noticed. During the second week of January preceding, she contracted a cold and had pain in swallowing, hoarseness, cough, and some expectoration. These symptoms passed away gradually, but there was general prostration of strength remaining, and the voice was weak. In the early part of the day she could often not speak loud at all, but the voice would appear in the course of the day. Complete aphonia occurred in the latter part of February. There was a time in the spring following, when she could occasionally, by extra effort, make a sound in a low unnatural tone; but, except that, she had spoken only in whisper since February.

This patient had a pale and "flabby" appearance. Light pressure along the spine caused complaint at several different points. The larynx was also somewhat tender on pressure. On examination with the laryngoscope, nothing abnormal was seen beyond a slight redness of the mucous membrane of the vocal cords near the opening to the ventricles: the greater portion of these ligaments were of the normal colour. On attempted phonation, the cords were nearly or quite approximated at the median line, but the vocal processes did not come into complete contact with each other, and the cartilaginous glottis was not closed: and when the air was forced against the cords they immediately separated without vibrating. Manipulation was at once resorted to. For a time the patient entirely failed to make a sound with expiration, and attempts with inspiration were advised. A few minutes only elapsed before a sound was heard, rough indeed, but evidently produced by the vocal cords. This sound gradually improved in strength and quality, and, in a short time, a sound with expiration was made. Finally, in about twenty minutes from the commencement of treatment, the full voice appeared, and she spoke without the aid of compression. There was a slight tendency, for a time, to whisper in conversing, as in some of the previous cases, but this did not exist in reading, the tone being clear and loud. The disposition to whisper, moreover, nearly or quite disappeared before the patient left my office.

The usual instructions with regard to reading aloud daily were given, and tonics were advised. The recovery has been permanent.

Remarks.—In these last two cases, it was certain that a voice-sound could be produced with inspiration, before it was possible with expiration: and it was also many times demonstrated, before complete restoration of the voice took place, that this sound was easily made, both in expiration and inspiration, with the aid of compression of the thyroid, when nothing above a whisper was possible without such aid. During the treatment of the last case these facts were brought to the notice of Dr. Davis.

It is perhaps unnecessary to say, that no local treatment for aphonia ought to be employed without a preliminary laryngoscopic examination and diagnosis. Especially should Manipulation not be attempted without such examination, for this treatment would not only be useless in most cases of unilateral or "constant" paralysis, but might be positively injurious, this form of paralysis being, generally, due to compression of the recurrent laryngeal nerve by an aneurism, by enlarged bronchial glands, or

by malignant growths, or to organic disease of the pneumogastric nerve itself. When, moreover, the examination shows the case to be one of paralysis of the adductors, it should be made reasonably certain that the cause does not lie at the nervous centre: this is, however, of extreme rarity.

Excessive general debility may also contraindicate Manipulation, as may a decided tendency to hæmoptysis.

Finally, the normal action of the vocal cords is often obstructed by organic changes in the tissues of the larynx, in which case treatment of the accompanying aphonia by compression would be injurious.

If any doubt should be entertained of the safety of Manipulation, I answer that experience has not developed any ill effects from its employment in suitable cases, and that old age as well as youth has offered subjects for the trial. It is understood that the force exercised should be confined to reasonable limits; it is, of course, possible to do injury to the larynx by the employment of great force.

But I am not disposed to claim for this method of treatment advantages over some other methods: on the contrary, I am free to acknowledge that, where there is a prospect of restoring the voice at once, or even within a reasonable time, by stimulating injections, by the employment of electricity, or by the "gymnastic" of Von Bruns, these methods might be, in many cases, preferable: I simply suggest *a* method not before, to my knowledge, described, and feel justified in saying that it is efficient and safe: it is certainly not without interest in a physiological point of view.

In the cases above-recorded, none of the usual methods of treatment were employed, because I desired to test the value of Manipulation; so that it is not certain that a single electric shock in the larynx would not have restored the voice immediately in all the six cases. I am, however, inclined strongly to the belief that in Case III., in which the affection was of eight years' duration, and in Case V., the most obstinate of the number, a prolonged course of treatment would have been necessary.

It is not unusual for physicians to advise patients with aphonia which they, often rightly, deem to be due to a debilitated condition of the general system, to make a change of residence, or to travel, telling them that the voice will return when the health improves. Recovery will undoubtedly be the result in many of such cases, but the loss of the voice is a serious infirmity, and has a constant depressing effect upon the individual. The more rational plan would seem to be to advise, first, an attempt to restore the voice, and if the result be successful, travel and other means of improving the health, to insure the permanency of the cure.

Since the foregoing pages were written, a striking proof of the influence of the inspiratory act upon phonation has presented itself to me, confirming the views expressed therein.

A lady, sixty years of age, came to me with an almost total inability to speak in the usual manner with the expired current of air: a condition of

six or seven years' duration. A single sound could be thus made, and monosyllables spoken, but with great difficulty and uncertainty, while it was impossible for her to speak a short sentence, or even to pronounce a word of more than one syllable. Each syllable, namely, required a separate and marked effort, while sometimes a double effort was required, as *ma-an* for *man*. The difficulty was not so much an inability to approximate the cords, as the want of power to maintain the approximation; and the adductor muscles were the ones at fault. Now this lady had discovered that she could speak while drawing in the breath, and had become accustomed to use the voice wholly in this way. There was an evident effort about it, as may be supposed, but speaking in the usual way, with expiration, was quite impracticable. In this instance the air passing in one direction, forced apart the weakened cords, while, when passing in the opposite direction, it tended to keep them in position, both influences being dependent purely upon the anatomical formation of the parts.

It will be naturally inferred that, if the compression of the thyroid wings produces the results above-mentioned, some aid might be afforded in derangements of the voice dependent on *moderate* loss of power of the adductor muscles; and such I have found to be the case, the voice becoming notably stronger during compression.

It may not be irrelevant in this connection to remark, that, in some cases of weakness of the voice apparently dependent upon a want of proper tension of the vocal cords, I have found material aid to be afforded by imitating the action of the crico-thyroid muscles, which are tensors of these ligaments. This is done by raising the anterior portion of the cricoid cartilage, approximating it to the lower front border of the thyroid cartilage.

ART. II.—*Observations on Poisoning with Rattlesnake Venom.* By S. WEIR MITCHELL, M. D. With *Microscopical Notes* by Jos. G. RICHARDSON, M. D.

I HAVE been able during the past summer to make observations upon certain points connected with snake poisons, which serve to complete portions of my former studies. I have also afforded to Dr. Richardson an opportunity of studying with higher powers than those formerly used by me, the blood of animals which were sick or dead from snake venom. His observations prove to my entire satisfaction the correctness of the belief I have already published as to the peculiar corpuscles described by Dr. Halford. Although I had long since criticized this gentleman's views, and pointed out that what he saw were probably Leucocytes, no one as yet has shown how it is that these come to assume the appearances described by Halford. Thus far all observers have failed to see the

corpuscles of Halford, and in a letter to me this gentleman intimates his own doubts as to their being new formations. Apart from this matter, Dr. Richardson's notes are of value as confirming many of my former conclusions as to the blood.

My own notes, of last summer's observations, concern only the influence of Rattlesnake Venom upon insects. On previous occasions I have made like examinations relative to the common crab and certain fishes.

The crab I found to be susceptible, but, as in other cold-blooded creatures, the poisoning is slow. The rattlesnake venom was introduced with the aid of a hypodermic syringe through the shell of the leg or between the joints of the dermal sheath which covers the belly. Then the holes were stopped with wax in such cases as they pierced the shell. Except a tendency to rest quiet there were no other symptoms, but of five crabs three died, none earlier than thirty-six hours, and one as late as fifty; two survived. Unfortunately I could not then procure any more living crabs, so that the result appears to me somewhat doubtful, because the doses were enormous if we consider only the bulk of the animal. In frogs, however, the same difficulty in poisoning exists, and the same delays occur, yet in these a larger experience enables us to feel sure that to the batrachia crotalus venom is certainly poisonous.

Among fish I have only examined the sunfish, and perch, and catfish, all of which perish from crotalus venom without convulsion within twelve to twenty-four hours, but rarely in two to four hours. Hypodermic injections of the venom were made near the spine, the fish being held meanwhile under water.

In July and September last Mr. Landis, my assistant, caught for me a number of insects upon which I experimented with rattlesnake venom as follows: In every case one or more healthy insects, of like species, were wounded in a similar manner with clean needles, while others were injured with needles upon which I had dried a thin layer of venom.

Katydid—*Platyphyllum concavum*. Wounded near anal aperture with envenomed pin; death in two hours.

Grasshopper—*Locusta Carolina*. Wounded like the last; death in two to three hours.

Locust—*Cicada pruinosa*. Wounded as above; death in one hour.

In the two following cases the experiments were made exactly as those already described.

Beetle—*Clytus pictus*. Death in twelve minutes.

do. do. Death in thirty minutes.

Others transfixd with clean needles lived many hours.

Grasshopper—*Locusta sulphurea*. Wounded in abdomen with envenomed needles, as were also—

Grasshopper—*Acrydium femur-rubrum*—

Cricket—*Acheta abbreviata*. Three in number—

Beetle—*Brachinus* (—)?

All died during the night, the experiments having been made late; all

of those which for comparison were stuck with clean pins were alive on the following morning. A moth *Dēiopeia bella*, as well as a caterpillar (*Saturnia Io.*) of another moth escaped the effects of envenomed pins, as in one single instance did a beetle *Brachinus*.

I endeavoured in vain to ascertain by similar experiments whether venom is fatal to spiders, but owing to the singular readiness with which they die from very slight wounds, I was unable to make the needed comparisons.

The following are Dr. RICHARDSON's notes of examinations of the blood of envenomed animals.

In an article on the toxicology of rattlesnake venom, published in the *New York Medical Journal* for January, 1868, Dr. S. Weir Mitchell, after a reference to Prof. G. B. Halford's paper describing the remarkable cells he observed in the blood of animals killed by snake-bite, suggested the theory that these strange cellular bodies might be simply white blood corpuscles altered in some unknown way by the action of the poison. On perusing the articles of Prof. Halford, as reprinted from the *Australian Medical Journal*, &c. (and kindly lent me by Dr. Mitchell), I was so impressed with the resemblance of the cells he figures to the white blood corpuscles when distended by water, as described in my paper on the identity of the white cells of the blood with the salivary, mucous and pus corpuscles (*Penna. Hospital Reports*, 1869), that at the recommendation and with the advice and assistance of Dr. Mitchell, I made the following researches in order to test the correctness of his hypothesis.

My first effort was, of course, to determine if possible under what conditions these cells could be recognized, for, according to the observations of Prof. Fayrer, of Calcutta, it would appear either that they require unusual skill in the use of the microscope for their detection, or else that their development is readily prevented by accidental causes; for he remarks in the *Edinburgh Medical Journal* for May, of the past year, in regard to a specimen of blood taken from the right auricle of a cat bitten by the *Daboia Russellii*, and dying in less than an hour: "I examined the blood most carefully and repeatedly under the microscope with the one-eighth inch object glass and a number three eye-piece, Nachet, and found the appearances differ very little if at all from those of ordinary blood. The only thing suggestive of any change in the corpuscles was, that in one or two specimens examined there were more granular corpuscles than may be considered as the natural proportion to the red corpuscles, but after the most careful examination, I was unable to detect any other change in their form or appearance. There was nothing resembling the appearances described by Prof. Halford."

M. A. Vulpian, also, in an article "Sur l'action du venin du cobra di capello" (*Archives de Physiologie Normal et Pathologique*, No. 1, 1869, p. 126) states as the results of experiments upon frogs, rats, and rabbits, "As regards the blood, I have never observed the modification pointed out by Mr. G. B. Halford, and can say that the poison of the *cobra di capello*, under the conditions that I have been able to study it, does not produce anything analogous to what this experimenter reports."

The Australian professor's account of his corrected observations on the blood after snake poisoning, may, perhaps, best be given in his own words,

which I quote from page thirteen of his pamphlet, "On the Injection of Ammonia into the Circulation (April 7, 1869)," as follows:—

"Let us suppose a dog to have been bitten (by a cobra, rattlesnake, or tiger-snake) at 11 A.M., and to have died at noon. It is probable nothing strange will be seen in the blood but granular matter as mentioned above, for two or three hours, but then in the midst of the germinal matter, which by this time has greatly increased in quantity, will be seen here and there nuclei with very sharp outlines, some single, others double, triple, and quadruple, many of them hour-glass shaped, as if dividing, and others again kidney shaped. At this time only the most practised observer could see the cell-wall of a few, and to do this requires a power of 1000 diameters and good management of the light. Numerous unaltered white corpuscles, pearly and opaque, may be seen here and there. By 5 P.M., the cells will be fully formed, their numbers literally innumerable, the nucleus usually single, division and multiplication having ceased; the macula may occasionally be seen, and the cell-wall which is of the most exceeding delicacy fully formed. *As the cells increase the nebulous germinal matter disappears.* Occasionally particles of germinal matter may be seen running between the nucleus and cell-wall. It is to be understood that I am describing the condition of the blood before any reagent whatsoever is applied, but now suppose we add a drop of magenta dye in the proportion of one part of dye to twenty or fifteen of water. Then immediately the cell-wall becomes coloured and distinctly visible, the nucleus more so, and lastly, the brilliant little macula is seen at some part of the circumference of the cell, being $\frac{1}{1700}$ of an inch, that of the nucleus $\frac{1}{2800}$ inch. The cells are of this size before the diluted dye is added. From this time every further observation for several days will show the cells in great abundance, until finally they become destroyed. The blood at the same time getting thinner and thinner."

Before proceeding to recount my observations on this subject, I should premise that they were all made with an immersion objective of one-twenty-fifth inch focus combined with the lowest eye piece carried by a Powell and Lealand's large stand, and so arranged as to give an amplification of 1170 diameters.

Expt. 1.—A full-grown black and white rabbit received under the skin of his left thigh about one grain of rattlesnake venom freshly extracted from a living snake at $4\frac{1}{2}$ P.M., September 7, 1869, and after the ordinary symptoms of gradual poisoning, died about 10 o'clock the same evening. On the day following at 3 P.M., fifteen hours after death, the thorax was carefully opened, the heart removed, and an aperture made in the right ventricle, which was found to contain about one-fourth of a drachm of fluid blood, dark in colour, but soon becoming red on exposure to the air; repeated examinations of this liquid showed that it contained few white blood corpuscles of the ordinary size and presenting their usual amœboid movements, but in their stead were observed numerous transparent spherical cells averaging about $\frac{1}{2800}$ of an inch in diameter, containing one, two, or three spots, resembling nuclei, measuring from $\frac{1}{3500}$ to $\frac{1}{3500}$ of an inch across, and which it seemed probable were the "peculiar cells" described by Prof. Halford in the memoirs above referred to; their smaller size being at once explained, if we accept the theory that they are distended white blood corpuscles, by the fact that those bodies in the rabbit are not quite so large as in the dog.

Expt. 2.—A young and healthy dog, weighing about fifteen pounds, had $\frac{1}{2}$ ss of blood drawn from the right femoral vein by means of a hypodermic syringe at 5 P.M., September 7, 1869. The fluid coagulated promptly and formed a firm dark clot, a small portion of which, broken down in a drop of the serum and examined at 9 P.M., four hours afterward, showed numerous white blood corpuscles rather larger than those of rabbits' blood, most of them in active amœboid movement among the red disks, the pseudopods being long and slender. At 5 P.M. September 8, twenty-four hours after being drawn from the animal, the amœboid movements had apparently ceased, the corpuscles had assumed a rounded form, and were from $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch in diameter, approximating

very closely to those of man not only in size but in general appearance. On the 9th of September, about 5 P.M., the same dog received an injection of two grains of rattlesnake venom beneath the skin of the left thigh. Two hours and a half afterwards, the animal showing very marked symptoms of poisoning, a specimen of blood drawn from the brachial vein and examined under the $\frac{1}{2}$ was found to contain a good deal of granular matter, also white blood corpuscles in ordinary numbers, many of them in active amœboid movement; about f3ss retained in a small vial did not coagulate and assumed a scarlet colour in a short time. Specimens of this were examined at intervals of eight to twelve hours for three days, during which period it did not undergo putrefaction, and a gradual expansion of part of the white blood globules into bodies resembling the salivary corpuscles and supposed to be the peculiar cells of Professor Halford, took place; not more than one-tenth of the white globules, however, appeared to be converted into these large spherical cells. After the venesection from his brachial the dog grew rapidly worse and died convulsed in about an hour and a half, four hours from the time the venom was injected. His heart was carefully removed and set aside in a glass vessel well covered to prevent drying until the next morning, when (twelve hours after death) one of the auricles was cut open and a drop of the fluid blood it contained in small quantity was placed upon a slide for examination. The red blood disks were normal, but the white corpuscles of ordinary aspect had almost universally disappeared and been replaced by spheres measuring from $\frac{20}{100}$ to $\frac{14}{100}$ of an inch in diameter, exhibiting nuclei varying in size, shape, and number, and in many instances presenting the actively moving molecules described by Prof. Halford (*vide supra*)—well known as characteristic of the salivary corpuscle, and proved by my own experiments above quoted to become visible generally when the white blood globule is distended from immersion in a fluid of lighter specific gravity than the liquor sanguinis. Eighteen hours after death about f3ss of liquid red blood was removed from a fresh incision into the left ventricle, and a small portion examined as before with a result precisely similar to that just detailed.

In order to vary the conditions of these experiments a rabbit was subjected to chronic snake poisoning by the introduction of small quantities of venom into its system at intervals of a day or two, and on the 22d of September, eighteen hours after its death, a specimen of blood from the abdominal aorta was found to be firmly coagulated, and of a dark purple colour; a minute portion of this cut off and compressed between the cover and slide with some of the exuded reddish serum showed white blood corpuscles generally rounded and without amœboid motion. A few, however, were undergoing slight changes of shape, and perhaps two per cent. of those observed were distended so far as to exhibit their nuclei and show the rapid movement of the contained molecules. The left auricle of the heart being incised was found occupied by a firm dark clot, a small portion of which, cut off and compressed as before, showed white corpuscles generally normal, only a few being somewhat distended and none entirely answering the description of Halford's cells. The amœboid motion was at this time, some twenty-four hours after death, no longer observable, nor could the movements of the contained molecules then be detected.

Expt. 45.—On the 26th of September a medium sized goat was killed by the injection of two grains of rattlesnake venom, a quantity that proved fatal in one hour from the time it was introduced. Two hours after death I opened the thorax, and, having tied all the great vessels, removed the heart without any exposure of its interior to the air. The following day, about eighteen hours after death, a small puncture was made in the wall of the right ventricle, and a glass tube drawn off to a conical extremity, which had just been heated almost to redness, was plunged into it; by slight pressure on the heart about one-fourth of a drachm of liquid blood was forced into the tube, which was then removed, a drop immediately transferred to a slide, and the remainder of the fluid allowed to flow into a small vial for preservation. On examination, it was found that of the granular bodies, which, from their resemblance to normal human white corpuscles, were doubtless the white blood cells, some were about $\frac{25}{100}$ of an inch in diameter, pearly and opaque, while others amounting to nearly twenty per cent. of the whole number were found $\frac{20}{100}$ to $\frac{13}{100}$ of an inch

across, and exhibited the active movement of contained molecules around the one or several nuclei which they inclosed; some few also manifested slight though positive amœboid motion. The red disks which seemed very minute as compared with human blood varied in size more than usual in other animals, and appeared to average about $\frac{1}{62500}$ of an inch in diameter. Either from some peculiarity of the goat tribe, or what is more probable, from an idiosyncrasy of this particular animal, the bodies corresponding to Halford's cells, instead of containing only one or two, exhibited three, four, and in some cases five distinct nuclei, and as this fact seemed to afford a good opportunity for strengthening the evidence already obtained, I placed another specimen of this blood on a slide under the field of the microscope, and after satisfying myself that, like the last, it contained one of the "peculiar cells" (generally multinucleated) to about four apparently unaltered white blood globules, I introduced pure water beneath the edge of this cover, and distended some of the latter corpuscles; enlarging their diameters and bringing into view their nuclei, which were in many cases as exceptionally numerous as they were previously observed to be in the cells of Halford. Not having any of the magenta dye which he recommends for bringing the maculæ into view, I employed as a substitute the solution of *Fuchsine*, another of the aniline colours, and found it easy to demonstrate by its action in some of the distended corpuscles a spot in the cell wall precisely similar to that he figures; in others, however, no maculæ were visible, while the majority exhibited an appearance of aggregated granules which seemed to me, at least in some cases, the mere result of corrugation, an effect of the reagent.

Some observations recorded by the Professor in regard to the occurrence of these cells in the blood of animals poisoned by hydrocyanic acid, as well as the results of my own experiments, seemed to confirm the theory that distension of the white corpuscles was intimately associated with whatever destruction of the fibro-genetic property causes the blood to lose its power of coagulation, and I should probably have been led to advocate such an hypothesis had I not been called upon, by a curious coincidence just at this time, to examine specimens from a patient who died of hydrophobia in the Pennsylvania Hospital, and so been enabled to satisfy myself how entirely the "peculiar cells" were absent in the fluid blood from his heart and great vessels. Subsequent observation showed us indeed that the development of these corpuscles may take place among the filaments of fibrin, as indicated by the following example:—

Expt. 5.—A specimen of blood from a guinea pig which had been injected two days before with the saliva of the hydrophobia patient, and was supposed to die from pyæmia, was removed from the right ventricle of the heart, and carefully examined. Most of the red disks were distorted and shrivelled, and the blood contained an immense quantity of the triangular crystals which form so readily in specimens from this animal; numerous fully distended white blood corpuscles, amounting to at least one-fourth of the whole number, were observed, and of the remaining three-fourths many had undergone partial dilatation. In order to be quite sure that bodies resembling Halford's cells existed in this coagulated blood, eight hours later the left ventricle was opened, the firm dark red clots occupying its cavity incised, a small fragment snipped out of its centre with curved scissors, and a minute portion of the fluid exuding from it when slightly pressed upon a glass slide examined beneath the microscope; in this specimen at least fifty per cent. of the white blood corpuscles were well distended, measuring upwards of $\frac{1}{20000}$ of an inch in diameter, exhibiting one, two, or three nuclei, generally without contained molecules, and not showing in any instance the appearance of fatty degeneration observed in the case of hydrophobia.

Proceeding now to group together the results of these experiments, it will be seen that in the example of a rabbit, dog, and goat, so poisoned by rattlesnake venom as to survive its insertion from one to six hours

only, whose hearts were allowed to remain unopened from twelve to twenty-four hours after death, the temperature varying from 75° to 90° Fahr., the blood when removed from the cardiac cavities in such a way as to avoid all contamination, and carefully examined with a high power, exhibited cells corresponding perfectly to those described by Prof. Halford; yet that these so-called "peculiar cells" were always mingled not only with white blood corpuscles in their ordinary "pearly and opaque" condition, but also with those in various stages of enlargement and alteration, such as may be at any time produced in the white globules of normal blood simply by diluting the liquor sanguinis with water; and further, that in the case of the goat, when a majority of the "peculiar cells" presented the unusual character of being multinucleated, the white blood globules, if disintended by water, exhibited the same peculiarity. We may, therefore, I think, fairly conclude that the abnormal corpuseles in these particular instances were in reality only white blood globules which had undergone an alteration similar to that caused by reducing the specific gravity of the blood, and so establish a strong presumption (whose correctness Prof. Halford can alone decide) that the "peculiar cells" described by him as resulting from the poison of snake bites are precisely analogous in their character.

In regard to the "thinning" of the blood I hope to have an opportunity of deciding as to its amount at some future time by taking the sp. gr. of that fluid at intervals after death by means of a hydrometer. To do this, however, one of the larger animals, as a horse, for example, will be required.

ART. III.—*Determination of the Optical Condition of the Eye by the Ophthalmoscope, with a new Modification of the Instrument for that purpose.*

By EDWARD G. LORING, M. D., Surgeon to the Manhattan Eye and Ear Hospital, N. Y., and the Brooklyn Eye and Ear Hospital, Long Island. (With eleven figures.)

If the ophthalmoscope was one of the most brilliant inventions ever known to medical science, it was certainly also one of the most complete, for the very method first proposed by Helmholtz still remains, by far the most beautiful, comprehensive, and truthful of all the means yet in our possession for the exploration of the bottom of the eye.

From the difficulties which this method is supposed to offer—difficulties which are rather imaginary than real—its use has never attained, even among oculists themselves, that prevalence which its merits deserve. Thanks, however, to the untiring perseverance of Jaeger as an observer, and his unequalled skill as a delineator, as well as to the written precept of his disciple Mauthner, examinations by the upright image are being pursued with a zeal which cannot fail to contribute largely to our knowledge of intraocular conditions, both normal and pathological.

There is, however, one particular advantage which this method offers above all others to the explanation of which the following remarks will exclusively apply, and that is, as Helmholtz himself pointed out, "the ability to determine the optical condition of the eye independent of its visual power, and the statements of the person examined."

Since Helmholtz first pointed out this fact in 1851, both Ed. Jaeger and Donders have written upon the subject, but it is to Mauthner, in his recent admirable work on the ophthalmoscope, that we are indebted for the most exhaustive treatise which exists on this important branch of ophthalmoscopy, and we sincerely regret that no translation of this text-book, which is by far the best which has ever appeared, has not yet been made into English.

Before passing to a detailed consideration of the methods of determining the various errors of refraction, there are some practical points common to the examination of all to which it may be well to call attention.

In regard to the kind of ophthalmoscope, any instrument which is provided with an apparatus at the back for holding the necessary glasses may be used. The kind of mirror too is rather a matter of preference than necessity; some observers preferring a plane, others a concave silvered one. For the simple determination of errors of refraction, I must say that I have a decided preference for the latter wherever it is not directly contraindicated by a dread of light on the part of the patient. There are, it is true, cases where the iris is unusually responsive to light, where it is necessary to use the weak illumination, and even here the difficulty can be usually met by reducing the volume of light employed.

If Jaeger's instrument is used, then the lamp which is the source of light can be at a distance laterally from the head of the person examined, which is somewhat of an advantage as a matter of comfort both to the observed and observer. If, however, an instrument is used like Liebreich's common ophthalmoscope, where the mirror is not set at an angle, then the light should be placed more on a line with the patient's head, so that the incident rays may strike the mirror at a reduced angle.

The position of the patient and examiner is not without importance. The observer should sit well to the side of the patient and on the side of course of the eye to be examined. If the right eye is to be examined, the patient should be directed to look slightly towards the right; if the left eye, then towards the left. This throws the optic axis away from the median line, places the optic nerve just opposite the pupil, and allows the observer to approach very near the observed eye without bending too much over the person examined.

The observer must learn to use either eye and either hand as occasion may require, so as to be able to examine the patient's right eye with his right and the left with his left, holding the ophthalmoscope in the right or left hand, as the case may be.

As the very word refraction implies the true optical value of an eye independent of its accommodation, it follows that this condition can only be ascertained when the eye examined is in a state of rest. Further, that it is indispensable that the observer should be aware of the exact state of refraction and accommodation of his own eye, before he can estimate that of another.

Perfect relaxation of the accommodation in the observed eye can of course be obtained by atropia, no matter what the nature of the refraction is. But usually, sufficient relaxation can be obtained in emmetropia by causing the patient to look into the distance, and as much as possible into vacancy, which is induced somewhat by having the walls of the ophthalmoscopic room painted black. For a myope it will only be necessary that he should look at some object which is at a greater distance than his far point. The ability and disability which hypermetropes have in relaxing their accommodation will better be considered a little later under its special heading.

As far as the observer is concerned, it can be laid down as a rule, at least for beginners, that the nearer the refraction of his eye approaches emmetropia and the more completely he can relax his accommodation, the better. This ability to relax the accommodation varies with different people, some acquiring the power completely, others only partially. Practice here, as everywhere else, increases the ability. If the observer is emmetropic, one of the best methods of acquiring this control over the accommodation is to take a convex glass of a moderate power, say $\frac{1}{8}$, and ascertain the farthest point at which fine type can be read with perfect distinctness through the glass, the other eye being closed, or better still, opened but excluded from the visual act by a screen, as under this condition there is a tendency for the visual axes to assume a parallel position, and with it that perfect state of rest usual to them when looking at the most distant objects. If the object can be moved in this case to a distance of eight inches, it is proof positive that the accommodation is entirely relaxed, since, as the object viewed is situated at the principal focus of the glass, only parallel rays can enter the eye, and such rays can only be brought to a focus on the retina of an emmetropic eye when it is in a state of perfect rest. This experiment should be repeated with glasses of various strengths till the ability is acquired of always seeing the test object at the focal distance of the glass used. This once acquired, a little further practice with the ophthalmoscope will also enable the observer to relax his accommodation during the examination.

If, however, the object viewed cannot be removed from the eye to a distance equal to the focal length of the glass, then it is evident that the accommodation is not entirely relaxed. If, for example, convex $\frac{1}{8}$ be used, and the object, instead of being seen distinctly at eight inches, can only be so seen at six, then it is evident that some accommodation is still going on, and the exact amount of this will be equal to the difference

between $\frac{1}{6}$ and $\frac{1}{8} = \frac{1}{24}$. Continued practice may soon enable the observer to overcome this involuntary contraction of the accommodation. Sometimes, however, in spite of all his efforts, it still remains, but he soon finds that the amount used is always the same. This then represents the optical condition of his eye. If, for example, he finds that the amount of accommodation which he still uses is $\frac{1}{16}$ or $\frac{1}{12}$, his eye is then, practically speaking, no longer emmetropic, but myopic, equal in fact to $\frac{1}{16}$ or $\frac{1}{12}$, as the case may be. Consequently, he must use a concave $\frac{1}{16}$ or $\frac{1}{12}$, in order to see clearly a near object, the rays from which, however, enter his eye as parallel. Having thus ascertained the optical condition of his eye in its greatest state of rest he should, having selected some one whose eye has been proved to be emmetropic, practise with the ophthalmoscope through the glass which he has previously found neutralizes the amount of accommodation which he involuntarily employs.

As a rule, then, the weakest concave glass through which the fundus of an emmetropic eye can be distinctly seen, should be taken as the criterion on which the emmetropic observer, who cannot entirely relax his accommodation, should base his estimates of refraction.

If the observer is ametropic, the simplest way for him is to reduce his ametropia by the suitable glass. More, however, in regard to this matter, will be found under its appropriate heading.

It is of course very essential, for an accurate determination of the refraction, to have some object point in the eye examined which shall be fine enough, not only to let us judge when we see, but when we are seeing with the most perfect sharpness.

The most conspicuous object, and one for which we at first instinctively look, is the papilla, but this should never be chosen, as it very frequently is however, as an object on which to found our observations, for the disk often protrudes, sometimes to an enormous degree, above the general plane of the rest of the retina,¹ and would thus frequently lead to the supposition that an eye was hypermetropic, sometimes markedly so, which was in reality emmetropic or even myopic. An eye lately examined by the writer was, for example, hypermetropic one-fortieth at the disk, but myopic one-eighteenth in the region of the macula. The general trunks of the central artery, besides being often on an advanced plane, at the nerve entrance, are in themselves seen under too great an enlargement to admit of nice discrimination in focal adjustment. There are, however, some very fine vessels which always leave the edge of the nerve, running out horizontally on both sides. These are admirably adapted for the purpose, when viewed at a little distance from the disk, especially towards the inner side; the best of all objects, however, at least for those who are skilful in this kind of examination, is the choroidal epithelium in the neighbourhood of the

¹ Compare Schweigger's Vorlesungen, Taf 1, figs. 1, 2.

macula, though the advantages which this region offers are more than counterbalanced by the difficulties which attend its examination.

The observer having found out the exact optical condition of his own eye, what remains for him to do is, first to ascertain the nature of the refraction of the eye under examination, and then, if ametropic, to determine the exact degree of the anomaly.

If the observer is emmetropic, and relaxes his accommodation entirely, he knows that his eye is adjusted for parallel rays only. Now the only kind of eye from which rays emerge parallel, is an emmetropic eye, consequently, if the fundus of the eye examined is focussed sharply on the observer's retina, the rays which enter his eye must be parallel, and the eye observed must be emmetropic.

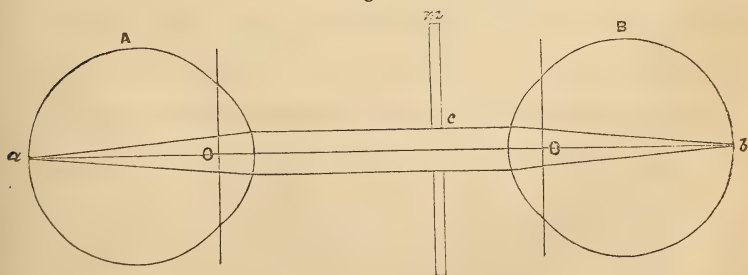
If, in a given case, the observer finds that he does not gain a clear view of the eye examined, when his own eye is in a state of rest, but that it becomes clear by using his accommodation, he then knows that the observed eye must be hypermetropic, since his own eye under tension of the accommodation is no longer adjusted for parallel, but for divergent rays, and there is no eye but a hypermetropic eye from which divergent rays can possibly come.

If the observer finds, however, that he can get no clear view of the fundus, either by relaxing or calling forth his accommodation, he knows that the rays coming from the observed eye cannot be either parallel or divergent, consequently they must be convergent, and the eye examined myopic.

Having thus ascertained, in a general way, the *nature* of the optical condition present, the next step is to determine the exact degree of the refraction. The method for doing this will be embodied, for the sake of convenience and brevity, in the following propositions, it being presupposed in all cases that the examined eye is in a state of rest.

PROPOSITION I. *For an emmetropic eye to determine that the observed eye is emmetropic.*—Let *A* (Fig. 1) be the observed eye illuminated by the

Fig. 1.

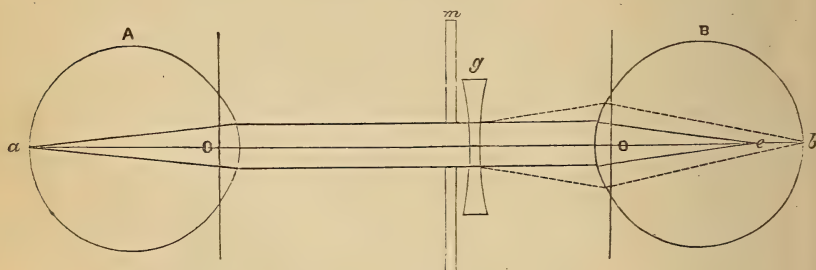


ophthalmoscopic mirror *m*. Since the eye is emmetropic, and in a state of rest, rays radiating from an illuminated point *a* on the retina must leave

the eye as parallel, and, as such, pass through the hole of the mirror *c*. If now the observer's eye is placed behind the mirror, the rays which strike his cornea, being parallel, will, since his own eye is emmetropic and in a state of rest, just come to a focus on his retina at the point *b*. A distinct image of the fundus will therefore be obtained, as what is true of one point is of all. As his eye is adjusted for parallel rays, and for no others, he knows the eye examined must be emmetropic; consequently, the fundus of an emmetropic eye can be distinctly seen by another emmetropic eye, without the aid of any correcting glass; providing, however, that the observer's eye is also in a state of rest.

If, however, the observer is unable to relax his accommodation entirely, it is evident that the parallel rays entering his eye must come to a focus in front of the retina, that is to say, rays coming from the point *a* (Fig. 1) will no longer come to a focus at *b*, but will unite in front of it at *e* (Fig. 2). Circles of dispersion will consequently be formed on *B*'s retina, and an indistinct image of *A*'s fundus will be the result.

Fig. 2.

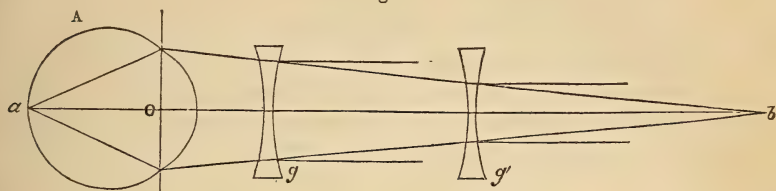


The reason of this is that *B*'s eye—as has been formerly explained—though emmetropic while looking at distant objects, is, as far as ophthalmoscopic examinations are concerned—since he cannot relax his accommodation—virtually myopic, and a concave glass (*g*) must be used behind the ophthalmoscope, to bring parallel rays to a focus on his retina. The weakest concave glass that will do this will then be just the amount that *B*'s accommodation cannot be relaxed, and with it his eye will be just adapted for parallel rays; consequently, when the fundus of an eye can only be seen clearly through this glass, the eye must be emmetropic.

PROPOSITION II. *The observer being emmetropic to determine the amount of myopia in the observed eye.*—As the observed eye is myopic, rays of light emerging from it are convergent, and will meet at a point in front of the eye, at a distance just equal to the amount of the myopia. If, for example, the myopia equals $\frac{1}{6}$ then the rays will meet at six inches in front of the nodal point. As the observer's eye, however, is emmetropic, and in a state of rest, it is accommodated, not for convergent but

parallel rays, so that before the convergent rays coming from a myopic eye can be focussed on the observer's retina, they must be made parallel. This will be made clear by the following diagram (Fig. 3).

Fig. 3.



Let A be an eye myopic $\frac{1}{6}$; rays of light leaving its retina will emerge convergent, and come to a focus six inches in front of the nodal point o , at the point b . If we could place a concave lens $\frac{1}{6}$ at the nodal point, we should neutralize the myopia, and the rays would then leave the eye as parallel, since the glass would then be just six inches from the point b , which would then represent the virtual focus of the glass. But as we cannot put the glass at the nodal point of the observed eye, we place it as near as the conditions of an ophthalmoscopic examination will permit. This distance is generally assumed to be about two inches. As the glass (g) is then two inches in front of the nodal point, the distance between it and the point b will be only four inches; consequently, it will require a concave $\frac{1}{4}$, to render the rays parallel at two inches from the eye, while it only required $\frac{1}{6}$ at the nodal point. If the glass (g') is at three inches from the nodal point, then it will be only three inches from the point b , and it will require a glass of $\frac{1}{3}$ to reduce the rays to parallel; consequently, $\frac{1}{3}$ three inches from the nodal point is equal to $\frac{1}{6}$ at it. That is to say, the glass required is just as much too strong as it is distant from the nodal point. We must therefore reduce it by this quantity. In the above cases it will be $\frac{1}{4} + 2 = \frac{1}{6}$. $\frac{1}{3} + 3 = \frac{1}{6}$. From which we deduce—

For an emmetropic observer whose eye is at rest, the myopia in a given case will equal the weakest concave glass through which the fundus is seen distinctly, plus the distance of the glass from the nodal point of the observed eye.

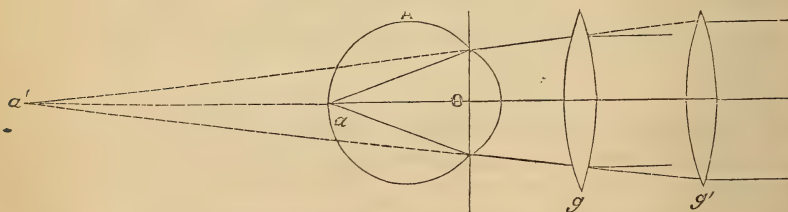
This will give the exact amount of the myopia present, but inasmuch as we usually measure degrees of ametropia by that glass which brings parallel rays to a focus on the retina, placed, not at the nodal point, but half an inch in front of it, we may for ordinary calculations omit this half inch. For example, we say a man is myopic $\frac{1}{6}$, when a concave $\frac{1}{6}$ placed one-half inch in front of his nodal point, brings parallel rays to a focus on the retina; he is really, however, myopic only $\frac{1}{6}\frac{1}{4}$. So, too, with the ophthalmoscope we may neglect this half inch, and then the result will give the amount of ametropia, as it is usually expressed, in glasses.

We have taken the distance between the glass and nodal point as two inches, simply as a matter of convenience and because it represents about the distance common to those who are not adepts in this kind of examinations, especially if they use Jaeger's ophthalmoscope. With a little practice the observer can reduce this distance to one inch instead of two, and if he uses an ophthalmoscope, the mirror of which lies in the same plane with the handle, he can with a little skill approach so near the eye, as to place the glass he looks through nearly in the position which the patient would in wearing his glasses. In this case the glass used would represent the amount of ametropia without further addition of the distance.

If the observer is unable to relax his accommodation when using the ophthalmoscope he is, as has already been explained, no longer emmetropic but virtually myopic to the amount of accommodation that he involuntarily calls forth. He has then to simply reduce his own eye to the condition of an emmetropic one by adding the suitable glass and then proceed as above.

PROPOSITION III. *The observer being emmetropic to estimate the degree of hypermetropia in a given case.*—As the observed eye is hypermetropic, rays emerging from it will have a direction as if they came from a point situated behind the eye observed, equal to the degree of the hypermetropia. Thus the rays coming from an eye hypermetropic $\frac{1}{8}$ will emerge from it as if they came from a point eight inches behind the nodal point. For example, let A (Fig. 4) be hypermetropic $\frac{1}{8}$, then the rays, coming from the point a on the retina, will after they leave the eye diverge as if they came from a' eight inches behind the eye. As the observer's eye is emmetropic and at rest, we must render these rays parallel before they

Fig. 4.



can come to a focus on his retina. If we could place a convex glass at the nodal point of A , it would require just $\frac{1}{8}$ to make the rays parallel, inasmuch as a' , which may be considered as the principal focus, is just eight inches distant, and this glass then would just equal the amount of H . If, however, we place the glass (g) behind the ophthalmoscope two inches in front of the observed eye A , then, as a' is ten inches from the glass it will only require $\frac{1}{10}$ to render the rays parallel. If the glass (g') is at four inches from the eye, then a' will be twelve inches from the glass,

and it will only require $\frac{1}{2}$. Consequently the glass used is as much weaker than the hypermetropia is, as it is distant from the nodal point; we must therefore make it so much stronger, before it can represent the true degree of H in the observed eye. In the above case, $H = \frac{1}{10-2} = \frac{1}{8}$, $H = \frac{1}{\frac{1}{2}-4} = \frac{1}{8}$.

The hypermetropia in the observed eye is therefore for an emmetropic observer always equal to the glass used, minus the distance of the glass from the nodal point of the examined eye.

As the accommodation is equivalent to a convex glass of different focal lengths, it is evident that the observer may substitute his own accommodation for the glass, provided he knows just how much he is using, and how far his nodal point is from that of the examined eye. For example, if the observer sees an eye distinctly, while he is conscious that he is accommodating for ten inches, he knows that the H in the observed eye must be equal to one-tenth minus the distance between the nodal points of his own and the observed eye. If this is two inches, then $H = \frac{1}{10-2} = \frac{1}{8}$.

The ability to judge of refraction by the degree of tension required of the accommodation, can only of course be brought into play in one condition, that is, where the observed eye is hypermetropic, and even here it is rather a *tour de force* than an essential advantage. We can all of us by a little practice get an approximate idea as to the amount of hypermetropia in a given case, by the amount of tension required of our accommodation in getting a clear view of the fundus, but very few even with any amount of practice ever approximate that precision which can be obtained with infinitely less trouble by means of glasses.

As in the above cases the rays of light passing through the hole of the mirror are parallel, and will continue so if uninterrupted to infinity, it makes no difference in the result whether the observer's eye is close against the instrument or a little removed from it. The only calculation necessary is the distance between the glass and nodal point of the examined eye.

The above directions, which are sufficient for an emmetropic observer whose eye is in a state of rest to determine any condition of refraction, may be summed up in this general rule:—

The ametropia in a given case is equal to the glass used plus the distance between it and the nodal point if the eye examined be myopic, minus the distance if it be hypermetropic.

If, however, the observer is so unfortunate as to be ametropic, then the simplest way for him is to reduce his eye to a condition of emmetropia, that is to say to that condition of refraction that parallel rays unite on his retina; considering that portion of the accommodation which cannot be relaxed as part and parcel of the refraction.

If the ametropic observer does this, then of course the preceding directions will be all that he will have to bear in mind. Should he not wish,

however, to pursue this course he will find in the appendix at the end of this paper the methods which he must follow.

Such being the theoretical rules, it remains to be seen how far they are applicable to the wants of the practitioner. The advantages offered by this method may be summed up as follows :—

(1). In the ability to tell the optical condition of the eye examined independent of the statements of the patient, or amount of vision of the eye.

(2). In measuring the amount of elevation or depression of given parts of the fundus.

Under the first heading the point which, without doubt, is the most important in a practical point of view, is the determination of the degree of latent hypermetropia.

The use of atropia and the trial by glasses is, and must remain in the vast majority of cases, the most certain test possible, still its use is attended with more or less inconvenience to all, and to some, with so much, that its employment is often impossible. Consequently, any means of diagnosing the amount of total hypermetropia, which is on the one hand accurate, and on the other free from inconvenience to the patient, cannot fail of being of the greatest value to the practitioner. The only question is, can the ophthalmoscope do this?

From the result of a series of trials with the ophthalmoscope, both before and after the use of atropia, Mauthner does not hesitate to answer this question in the affirmative; laying it down as a law that "*In examinations with the ophthalmoscope (by the upright image) the total hypermetropia is revealed.*"¹ This opinion is supported by the citation of the following remarkable case :—

A boy of twelve years presented the usual symptoms of asthenopia. Both concave and convex glasses were declined for distant vision. Even convex $\frac{1}{60}$ was obstinately rejected. The ophthalmoscopic examination brought to light a hypermetropia of $\frac{1}{6}$. The eye was then paralyzed with atropia, and the total H was found to be by glasses $\frac{1}{6}$.

Inasmuch as I have never seen a case of total H of so high a grade as $\frac{1}{6}$ where there was no manifest at all, I am unable to corroborate the above case with a precisely similar one from my own practice. I could, however, cite many where the degree of the manifest was very trifling in proportion to the total revealed by the ophthalmoscope, and where the latter obtained by this means differed but slightly from what was subsequently obtained by the use of atropia and glasses. For example, $\frac{1}{36}$ with glasses, $\frac{1}{12}$ with the ophthalmoscope; $\frac{1}{24}$ with glasses, $\frac{1}{8}$ with the ophthalmoscope, $\frac{1}{8}$ with atropia; $\frac{1}{8}$ with glasses, $\frac{1}{8}$ with the ophthalmoscope, $\frac{1}{6\frac{1}{2}}$ with atropia; $\frac{1}{11}$ with glasses, $\frac{1}{4}$ with the ophthalmoscope; $\frac{1}{12}$

¹ Mauthner, ab. 1, p. 174.

with glasses, $\frac{1}{6}$ with the ophthalmoscope, $\frac{1}{6}$ with atropia, etc. etc. Such glittering results as these certainly need but little comment, and their practical application but little explanation, the only wonder being that examinations of this kind are not as universal as the use of the ophthalmoscope itself.

There is one point which at first appears curious, and that is, that we get the most exact and certainly by far the most brilliant results just where we should expect them least; that is, with the highest grades of hypermetropia, at least such has been the writer's experience; so much so that he feels convinced that it is very difficult, sometimes impossible, with young people to tell the lighter degrees of H (above one-fortieth) with the ophthalmoscope, unless indeed atropia has been used. This he believes to be owing to the fact that hypermetropes of a high degree often relax their accommodation entirely while looking inattentively into the distance, making no effort to call forth their accommodation till their attention is aroused; when, however, their attention is called to some particular object, they instinctively call forth that amount, or very near it, which is demanded for parallel rays. Consequently, under glasses where particular attention is required of them in deciphering the smaller letters of the test board, they refuse to relax their accommodation except to a trifling degree. But when placed in a dimly-lighted room and told to look at a wall which offers a blank and diffused surface, and which will appear to them but a little less distinct even when seen in circles of dispersion, they have no difficulty in relaxing their accommodation. But young persons who have say $H \frac{1}{40}$ or less, see clearly in the distance with so little effort, that they probably never relax their accommodation, preferring to make slight demands on their ciliary muscle to seeing in circles of dispersion. Their condition is practically emmetropic, and in the ophthalmoscopic room they relax their A no more than they are accustomed to, accommodating for the plane of the wall which they see distinctly, or at most for parallel rays. We may, however, lay it down as a rule even in these cases, that where but little or no H can be detected either by glasses or the ophthalmoscope, little or none exists.

Without being able to accept then, unreservedly, Mauthner's general statement, that the total H can be invariably determined with the ophthalmoscope, we nevertheless believe that a very close approximation to it can almost invariably be obtained.

So much for the ophthalmoscope where atropia has not been used, but there are cases in which it is even superior to the test by atropia and glasses, where the latter indeed utterly fail in giving an idea of the amount of hypermetropia, as the following case will show:—

A bright little girl was brought to me for the purpose of having the exact optical condition of the eyes determined. With a convex one-twenty-

fourth vision was decidedly improved; amounting, however, even with the glass, only to $\frac{1}{5}$ in the right eye, $\frac{1}{10}$ in the left. The same result was obtained under atropia. Glasses of various strengths from $\frac{1}{4}$ to $\frac{1}{2}$ were tried, and still the vision remained about the same. Recourse was now had to the ophthalmoscope, when a total H of $\frac{1}{2}$ was found in the right, $\frac{1}{5}$ in the left eye. The discrepancy between the glass selected by the child and the amount of H as given by the ophthalmoscope was so great, that an independent examination was made by another oculist with precisely the same result in each eye. There was evidently a large amount of congenital amblyopia, the only hope of relieving which, certainly lay in careful and systematic exercise through that glass which would produce sharply defined images upon the retina, and this glass could only be ascertained through the ophthalmoscope. Previous experience had already taught me that wonderful results could be obtained in this manner, and I ventured to give an encouraging prognosis.

So, too, in strabismus in children, it is often impossible, from their inability to read, or the irrelevancy of their answers, to get an adequate idea as to the condition of the refraction, even where atropia has been used. And yet the whole question in regard to operative interference may turn on the presence or non presence of H and its degree. With the ophthalmoscope, however, with a little care and with a dilated pupil, the exact amount, or what approximates to it very closely, can, as a rule, be ascertained, even with children in arms.

So, too, in any disease in which amblyopia is an element.

One of the most interesting attributes of the upright image is the means which it affords us for determining the various planes which different parts of the fundus often occupy. For, inasmuch as a certain amount of refraction corresponds to a given length of the axis of the eye, we have only to know the refraction of a certain point to know its exact antero-posterior position, and the difference of refraction between two given points must represent their difference of level. We are thus enabled to measure numerically, for example, the amount of excavation of the optic nerve or its projection above the level of the retina; the projection of the choroid or retina from underlying effusion; the height of tumours and their rate of increase; the amount of swelling in the retina; the situations of membranes in the vitreous, etc.

Taking the emmetropic eye as a standard, calculations have been made by various authors to determine what amount of increase or decrease in the length of the optic axis corresponds to a given degree of hypermetropia or myopia. I have calculated for the easy reference of the reader, from the formulas given by Mauthner, p. 67, 226, ab. 1, the two following tables, the first representing the amount of decrease in length of the axis due to H , and the second the increase due to M .

TABLE I.

$H \frac{1}{2}$ equals a shortening of 3.96 Mm.					$H \frac{1}{12}$ equals a shortening of 0.85 Mm.				
" $\frac{1}{3}$	"	"	"	2.9	"	" $\frac{1}{12}$	"	"	0.74
" $\frac{1}{4}$	"	"	"	2.3	"	" $\frac{1}{15}$	"	"	0.65
" $\frac{1}{5}$	"	"	"	1.89	"	" $\frac{1}{18}$	"	"	0.58
" $\frac{1}{6}$	"	"	"	1.6	"	" $\frac{1}{20}$	"	"	0.52
" $\frac{1}{7}$	"	"	"	1.4	"	" $\frac{1}{24}$	"	"	0.45
" $\frac{1}{8}$	"	"	"	1.25	"	" $\frac{1}{30}$	"	"	0.35
" $\frac{1}{9}$	"	"	"	1.12	"	" $\frac{1}{40}$	"	"	0.26
" $\frac{1}{10}$	"	"	"	1.	"	" $\frac{1}{50}$	"	"	0.21
" $\frac{1}{11}$	"	"	"	0.92	"				

TABLE II.

$M \frac{1}{2}$ equals an increase of 8.6 Mm.					$M \frac{1}{12}$ equals an increase of 0.97 Mm.				
" $\frac{1}{2}$	"	"	"	4.81	"	" $\frac{1}{12}$	"	"	0.82
" $\frac{1}{4}$	"	"	"	3.34	"	" $\frac{1}{15}$	"	"	0.71
" $\frac{1}{5}$	"	"	"	2.56	"	" $\frac{1}{18}$	"	"	0.63
" $\frac{1}{6}$	"	"	"	2.07	"	" $\frac{1}{20}$	"	"	0.56
" $\frac{1}{7}$	"	"	"	1.97	"	" $\frac{1}{24}$	"	"	0.46
" $\frac{1}{8}$	"	"	"	1.5	"	" $\frac{1}{30}$	"	"	0.37
" $\frac{1}{9}$	"	"	"	1.31	"	" $\frac{1}{40}$	"	"	0.27
" $\frac{1}{10}$	"	"	"	1.17	"	" $\frac{1}{50}$	"	"	0.22
" $\frac{1}{11}$	"	"	"	1.62	"				

The application of the above tables will perhaps be made clearer by some examples.

In a case of glaucoma the edge of the nerve is emmetropic, while the bottom of the excavation is myopic $\frac{1}{8}$. As myopia $\frac{1}{8}$ signifies a lengthening of the axis equal to 1.5 Mm. (see Table II.), the depth of the excavations must be, since the edge of the nerve is emmetropic, equal to 1.5 Mm. In a second case the border of the nerve and general fundus is myopic $\frac{1}{24}$, the bottom of the excavation is myopic $\frac{1}{8}$; the true extent of the excavation will then be equal to $\frac{1}{8} - \frac{1}{24} = \frac{1}{12}$ $M \frac{1}{12} = 0.97$ Mm. In a third case the edge of the nerve is $H \frac{1}{30}$; the bottom of the excavation is still myopic $\frac{1}{8}$. As $H \frac{1}{30}$ represents a shortening of the axis 0.35 Mm. and $M \frac{1}{8}$ an increase of 1.5, the true extent of the excavation will be $1.5 + 0.35 = 1.85$ Mm.

In a case of neuritis, following sunstroke, the centre of the nerve to which the disease was almost entirely confined was hypermetropic $\frac{1}{11}$, the neighbouring region was emmetropic. As $H \frac{1}{11}$ represents a shortening of the axis = 0.92 Mm., the protrusion of the nerve was 0.92 Mm.

In another case of violent neuro-retinitis in the left eye the centre of the nerve was $H \frac{1}{6}$; a little further onward, $H \frac{1}{10}$; a little further still, $H \frac{1}{15}$; and at the farthest extremity of the field, towards the ora serrata, $H \frac{1}{30}$. In the other eye in which the process has just commenced, the general refraction was $H = \frac{1}{40}$. Assuming then that the refraction of the eyes when in a state of health was emmetropic, and it could not have been far from this, a plan might easily be drawn (as indeed was done) representing the amount of swelling due to the morbid process. This might be subsequently compared with the future progress and recession of the disease, under atrophy, etc., and some interesting results obtained. It is of course very difficult to follow these cases of retinal swelling, such as are common to Bright's disease, from their beginning to their end; still such opportunities do occur, even where the cause is renal, and it

appears to me many interesting facts might be obtained from such investigations.

In a certain case a well-marked tumour was observed, situated exactly above the optic nerve, the upper edge of which it overhung. As the media were perfectly clear, a distinct view of the growth in all its detail was obtained. The crest of the tumour was, at the first examination, hypermetropic $\frac{1}{6}$. The lower half of the nerve and all the surrounding fundus was emmetropic; the protrusion of the growth was then 1.6 Mm. A subsequent examination was made and the crest of the tumour was found to be $H \frac{1}{4}$, the protrusion was then 2.3 mm., and the increase between the two examinations was $2.3 - 1.6 \text{ mm} = 0.7 \text{ mm}$.

In another case a membrane in the vitreous appeared clearly defined when $+\frac{1}{3}$ was used, one inch from the nodal point of the examined eye; consequently there would have been, if the retina had occupied the plane of the membrane $H = \frac{1}{3} - 1 = \frac{1}{2}$. The fundus was in fact emmetropic; the membrane was, therefore, in front of the retina to a degree equal to $H \frac{1}{2} = 3.96 \text{ Mm}$.

The determination of Astigmatism.—The determination of astigmatism by means of the ophthalmoscope has always been considered one of the most difficult, and from its want of accuracy one of the least satisfactory applications of the instrument, and there is no doubt that this is, to a great extent, true. Still, the difficulty in ascertaining the existence of astigmatism, and the uncertainty in establishing its degree, are, I think, due in a great measure to the method adopted, which has usually depended on the fact, first pointed out by Schweigger, that in astigmatism the disk was seen elongated in one direction with the upright image, and in the opposite by the inverted. The effect involved in this fact is due to the following causes:—

If we look through a convex lens at an object which is placed within its principal focus, we see it magnified to a certain degree, according to the power of the lens.

If we make, for example, a small cross, the arms of which are of equal length, and view it through a common convex glass, say of three inches focal distance, it appears enlarged, but equally in both directions, as the magnifying power is the same for each arm. If we now add, however, a convex cylindric glass $\frac{1}{6}$ to the spherical, we increase the magnifying power in one principal direction without altering it in the other. The lens is, therefore, equal in one direction to $\frac{1}{3}$, but in the other to $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$. If we now turn the glass in such a way that the strongest magnifying power shall correspond with the vertical arm of the cross, this will be more enlarged than the horizontal, which is seen through a weaker power, and will consequently appear longer. If we now draw a circle round the arms of the cross in such a way that these shall be the radii, the effect will still be the same, and the circle will appear elongated in the vertical direction because it is more magnified in that direction, consequently it will appear no longer a circle, but an oval.

If, however, we now take a second lens and hold it in the other hand at a certain distance in front of the first lens, just as we do in the indirect method with the ophthalmoscope, then we get an inverted image of the cross, and circle round it, elongated no longer in the vertical but in the horizontal position. The reason of this is that the rays passing through the first lens, whose principal meridians are of different focal power, are refracted unequally, those passing through the vertical meridian where the lens is of two inches focal power more than those passing through the horizontal where it is only three inches. As the rays passing through the vertical meridian are more refracted by the first lens, they will, after passing through the second, come to a focus sooner behind it, and the nearer the rays meet behind a lens the smaller is the image, consequently the vertical line of the cross will now appear smaller than the horizontal, and the circle will now be elongated horizontally.

Applying this principal to the eye, Schweigger deduced the fact that with the upright image the disk in astigmatism is seen elongated in the direction of the meridian of greatest refraction, with the inverted image in the meridian of the least refraction. This gives us at once the directions of the principal meridians, and we have only to find the glass which reduces the distortion to know the kind and amount of astigmatism.

It will be seen at once that an examination must be made by *both* methods, for it may happen that the disk may be elongated anatomically in a vertical, horizontal, or oblique direction, the effect of which might be so counteracted by astigmatism as to make the disk appear round when the ophthalmoscopic examination was made by only one method, but never when both are employed.

Simple and true as all this is on paper, its application to practical wants is limited from the fact that the distortion under the degrees of astigmatism which usually occur in the human eye, is not sufficient to form a basis for accurate calculation. It may be well to state, however, that the effect is always increased by the observer's alternately withdrawing from, and approaching the eye examined, watching as he does so the change in the contour of the nerve.

From the uncertainty and want of delicacy attending this method of examination, it is evident that, in order to make the ophthalmoscope of practical use in astigmatism, we must look for some more sensitive test to act either as a supplement or a substitute to the above, and this we have in the vessels.

If we consider the optic disk as the centre of a circle, and all the vessels large and small radiating from it as so many straight lines, we have in the fundus of the eye itself a representation of Dr. Green's test for astigmatism, in which the principal branches of the central artery and veins represent the vertical lines, and the small vessels leaving the edge of the disk the horizontal and oblique. It may be said that the principal trunks of the

central artery and veins do not always run exactly vertical. This is true, but such is their general tendency, and the fact that the vessels do not continue in their original vertical course is of itself an assistance to the diagnosis.

The practical application of this is as follows: If we look with the ophthalmoscope through the cornea of an astigmatic eye to the retina beyond, the effect is precisely the same as if we were looking through an astigmatic glass, and the vessels radiating from the optic nerve will then appear just as the radiating lines do in the common test when seen through a cylindric glass, *most distinct in the meridian of greatest ametropia*. This gives us at once the direction of one of the principal meridians, and we know that the direction of the other must be at right angles to it. Having thus found out the direction of the principal meridians, we have then only to determine the refraction of each meridian separately, and the difference between the two will be the amount of astigmatism. If, for example, in a certain case the vertical vessels appear perfectly distinct, and are only rendered less so by glasses, one of the principal meridians of the eye must be emmetropic. If, however, the fine horizontal vessels are only made distinct by a concave $\frac{1}{24}$, then the second principal meridian must be myopic $\frac{1}{24}$, and inasmuch as the first was emmetropic, the amount of astigmatism present must be one-twenty-fourth.

It is a little puzzling for those who are not much accustomed to the determination of astigmatism, to understand how it is that the vessels, as do radiating lines, always appear most distinct to an emmetropic eye, in the meridian of the greatest ametropia, instead of, as would appear more rational, in that of the least. It would, for example, seem more natural, that inasmuch as the vertical vessels were seen in the above case most distinctly, that the vertical meridian should be the one which deviated least from the normal. But it must be borne in mind that the rays which form the vertical boundary of these vessels are, in fact, horizontal rays, and as such pass through, not the vertical, but the horizontal meridian, and as this is emmetropic they are readily focussed in the observer's retina. On the other hand, the rays which form the boundary of the horizontal vessels are vertical rays, and pass through the vertical meridian, which is myopic, and consequently the horizontal vessels are indistinct, although this meridian is, in fact, emmetropic.

This, of course, holds good for all kinds and degrees of astigmatism.

The writer readily admits that this method is also, though by no means in the same degree, wanting in accuracy, and is not to be looked upon at all as a substitute for the trial by glasses, but is to be used in co-operation with it. When so employed, the ophthalmoscope often renders important service in revealing to us at a single glance, as it were, the nature of the anomaly and the general direction of the principal meridians, when to have obtained them by glasses would have been an affair of hours. In

cases of mixed astigmatism this holds true in a marked degree, and I cannot forbear, for the sake of their practical bearing, from citing the two following cases:—

A young lad was examined by me, who, it was alleged by his parents, was nearly "blind" in one eye. On testing the eyes, the left was found to have a trifling degree of hypermetropia ($\frac{1}{80}$) with vision one. In the right eye, however, vision was reduced to $\frac{1}{20}$, that is, Snellen C. could only be read in five feet. A few trials were made with glasses with no material improvement in vision. In looking into the eye with the ophthalmoscope the nerve appeared distorted and drawn out vertically, while at the same time its outline was indistinct in all directions, as were also all the vessels. On using the accommodation, however, the vertical edge of the nerve became well defined, as did all the vessels, so long as they ran in a vertical direction, but as soon as they deviated from this they at once became indistinct, and in proportion to the amount of the deviation. This was very apparent at a certain place where one of the larger vessels divided, sending off a branch almost at right angles to the original direction of the vessel. The branch which continued in the vertical direction remained perfectly distinct, and the double contour of its walls clearly defined, while that running at right angles to it, that is, horizontally, was indistinct and evidently much out of focus, as were, in fact, all the vessels, large and small, running in this direction, and no amount of tension or relaxation of the accommodation made them clearly defined.

It was manifest that astigmatism was present, and that the directions of the principal meridians were vertical and horizontal. It was evident, too, that as it required the action of the accommodation to make the vertical vessels distinct, that there must be hypermetropia in the horizontal meridian. In determining the degree, it was found that the strongest glass through which a certain fine vertical vessel remained distinct at two inches distance was a convex $\frac{1}{16}$, the hypermetropia in the horizontal meridian was therefore equal to $\frac{1}{16} - 2 = \frac{1}{4}$.

As the horizontal edge of the nerve and all the vessels running horizontally remained indistinct, even when the observer's accommodation was perfectly relaxed, it was evident that the rays which formed the horizontal boundary of the nerve and vessels must leave the eye as convergent, and as these rays are vertical rays, the eye must be myopic in the vertical meridian. It was found that the weakest glass under which the horizontal boundary of the nerve and vessels became sharply defined was $-\frac{1}{10}$, the vertical meridian was therefore myopic equal to $-\frac{1}{10} + 2 = \frac{1}{2}$.

The case was therefore one of mixed astigmatism, in which the vertical meridian was myopic $\frac{1}{2}$, and the horizontal hypermetropic $\frac{1}{4}$, and the discrepancy between the two meridians was $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$. With a bicylindric glass $-\frac{1}{2}$ and $+\frac{1}{4}$ vision at once rose from $\frac{1}{20}$ to $\frac{8}{20}$. It was in fact increased eightfold. It was subsequently found from a care

ful examination that $-\frac{1}{18}c$ and $+\frac{1}{12}c$ was preferred. With this glass, vision became one-half.

In another case, where the patient suffered a great deal from asthenopic symptoms, vision was found to be only one-fifth in either eye. Reading was performed at six inches, while in sewing the patient declared that she had to exercise great care to keep from wounding her nose with the needle. As in the former case, spherical glasses were tried with but little improvement of vision. On looking into the eye, here too neither the nerve nor any of the vessels appeared distinctly defined. On accommodating, however, it was seen that although the vertical and horizontal vessels still remained comparatively indistinct, those that originally ran, and those which later in their course assumed an oblique direction upwards and inwards and downwards and outwards (about $+30^\circ$ Green) suddenly came sharply into view, while those which ran at right angles became the most indistinct of all. The same effect was noticed all over the fundus, especially in following along the course of a vessel, some of whose branches appeared perfectly distinct, while those running at right angles were much out of focus. This meridian was found to be myopic $\frac{1}{20}$, the opposite hypermetropic $\frac{1}{11}$. With these glasses properly arranged, vision rose from one-fifth to two-thirds, and the patient could read Jaeger No. 4 at ten inches, and sew with ease at twelve. The left eye was $\frac{1}{18}c \text{ } \Gamma - \frac{1}{20}c \text{ } V = \frac{1}{2} +$.

One of the principal causes which have retarded the more general use of the upright image in ophthalmoscopy is the necessity for a constant change of the glass behind the mirror and consequent loss of time and inconvenience. To avoid this, and to expedite the determination of errors of refraction, the writer has adopted the following modification of the ophthalmoscope,¹ the principal feature of which is the substitution of detachable cylinders for the fixed Rekoss disk, now common to a number of ophthalmoscopes. In the present case but three cylinders are employed, though these might be multiplied indefinitely were there any occasion for so doing. Each cylinder is pierced for eight glasses, forming in the aggregate the following series:—

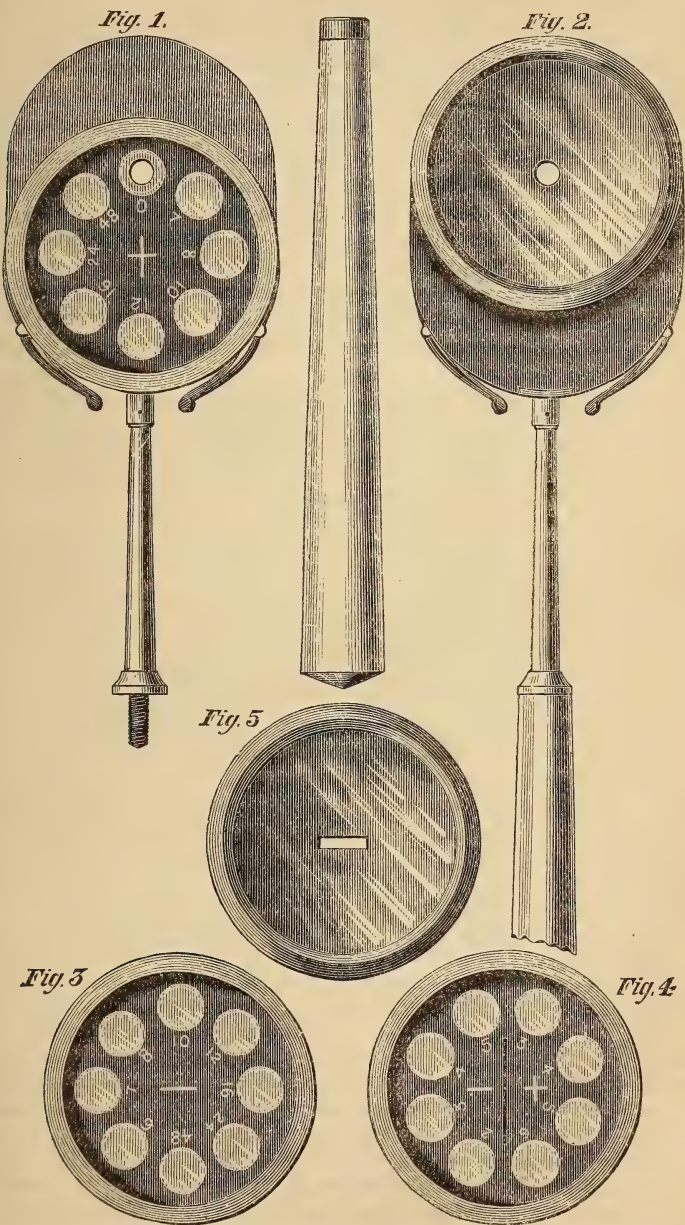
Convex.....0,	$\frac{1}{48}$,	$\frac{1}{24}$,	$\frac{1}{16}$,	$\frac{1}{12}$,	$\frac{1}{10}$,	$\frac{1}{8}$,	$\frac{1}{7}$,	$\frac{1}{6}$,	$\frac{1}{5}$,	$\frac{1}{4}$,	$\frac{1}{3}$.
Concave.....	$\frac{1}{48}$,	$\frac{1}{24}$,	$\frac{1}{16}$,	$\frac{1}{12}$,	$\frac{1}{10}$,	$\frac{1}{8}$,	$\frac{1}{7}$,	$\frac{1}{6}$,	$\frac{1}{5}$,	$\frac{1}{4}$,	$\frac{1}{3}$, $\frac{1}{2}$.

Thus we have a series of glasses extending, with but comparatively slight differences in focal value, from convex $\frac{1}{48}$ to $\frac{1}{3}$ and from concave $\frac{1}{48}$ to $\frac{1}{2}$.

The manner in which the glasses are divided among the cylinders will

¹ This instrument was exhibited to the American Ophthalmological Association at its meeting in July last, and a description of it is inserted in their Transactions, but as that publication is not accessible to most of our readers, a few copies only having been printed, and as the description is essential to the completion of this paper, we reproduce it here.

be readily understood from the accompanying figures. The first cylinder is made up entirely of convex glasses, by means of which all ordinary de-



EXPLANATION OF FIGURES.—Fig. 1. Back of instrument with cylinder in position. Fig. 2. Front view of instrument. Figs. 3 and 4. Remaining cylinders detached. Fig. 5. Astigmatic optometer and mirror.

degrees of hypermetropia can with sufficient exactness be determined. One hole (0) is left vacant to represent emmetropia, without the necessity of removing the cylinder, and for examination by the inverted image without an eye-piece; should, however, the latter be desired, the observer has a large selection at his command. The second cylinder contains the concaves of moderate focal power, and the third is composed of the high numbers, both positive and negative. These strong numbers are designed for the determination of the highest degrees of errors of refraction and for the measurement of the inequalities of the fundus, such as excavations and elevations of the optic nerve, projections of tumours, retinal detachments, membranes in the vitreous, etc. With the stronger convex, such as $\frac{1}{3}$, opacities of the cornea and lens can be viewed under considerable enlargement.

The cylinders fit into a cell at the back of the instrument and are held firmly in their place by means of the two small springs shown in the engraving, which projecting into a groove in the side of the cylinders, prevent these from falling out, yet do not interfere with their rotation. In turning, the centre of the glass comes opposite the centre of the hole in the mirror.

Great care was taken to have the mirror, which is concave, seven inches' focal distance, ground exceedingly thin—as thin almost as a metal mirror—while the surrounding brass work is so bevelled away that as little impediment as possible is offered to the passage of the rays, thus rendering the image perfectly distinct, and I think unusually brilliant.

The mirror being contained in a separate case of its own is made detachable from the rest of the instrument, which can then be used as an optometer, the patient himself revolving the cylinder till the suitable glass is obtained. As the perforation through which the patient looks when the mirror is removed is equal to the diameter of the glass (three lines), and is much larger than the normal pupil, the peripheral rays are not cut off, which is usually a source of error when smaller diaphragms are used.

The handle of the instrument has purposely been made unusually long, so that the observer's hand shall not interfere with an easy and close proximity to the observed eye, which is a great advantage in examination by the upright image.

The instrument, the three cylinders, and a convex two and one-half inch lens for examination by the inverted image, are all contained in a small pocket-case, measuring four and three-quarter inches by two and one-half square by three-quarters thick.

Besides the common concave mirror which comes with the instrument, I have had two others constructed which may not be unworthy of mention. The first is intended for examination by the "weak illumination," and is precisely similar to the common concave 7" mirror, silvered on the back, only it is made from London smoke instead of colorless glass.

As it is the property of London smoke glass to simply reduce the quantity of the transmitted light without sensibly altering its colour, it occurred to me that any degree of illumination might be obtained by using various shades of the glass, without sensibly changing the appearance of the fundus. I have made many experiments with these mirrors and have finally settled upon two as the most serviceable. One is even weaker than the three plates of plane glass—so weak indeed that the patient is hardly aware that any light is thrown into his eye. The other is made from a much lighter shade, and gives a reflection intermediate in brilliancy between the ordinary weak and strong reflectors. By its means a much

more brilliant picture is obtained than with the plane glass mirror, while at the same time with much less glare to the patient than with the ordinary silvered one. The advantages of these mirrors are that the quantity of light can be varied and that they can be so easily kept clean.

The common weak mirror, consisting of three plates of plane glass, could however be easily fitted to the instrument should it be desired.

The remaining mirror mentioned above was originally designed for a stenopæic slit to be used with the instrument when employed as an optometer for the determination of astigmatism. It consisted of a thin plate with a slit in it, whose length was equal to the diameter of the perforations in the cylinder. This was mounted like the mirror, and made to fit in the mirror cell in which it revolved, so as to allow the slit to correspond with any given meridian of the cornea. The meridian once determined, the patient turned the cylinder till the suitable glass was obtained. This plate was subsequently made with a polished surface in front, and then was made to serve also as a mirror for determining, by means of the ophthalmoscope, the amount of astigmatism in the principal meridians of the eye.

I would take this opportunity of informing those who are desirous of obtaining this instrument that it can be had of its maker, H. W. Hunter, Optician, 1132 Broadway, N. Y. City.

APPENDIX.

Directions to be Observed in Case the Observer is Ametropic.

The observer being myopic.

PROPOSITION I. *For a myope to examine an emmetropic eye.*—It is very evident that as the rays which leave an emmetropic eye are parallel, that the myopic observer, provided he can relax his accommodation, will simply have to use the glass behind the mirror, which neutralizes his myopia, that is to say, which brings parallel rays to a focus on his retina. If a concave $\frac{1}{2}$ does this, then $\frac{1}{2}$ will be the glass employed, and whenever he sees an eye distinctly with this glass, he knows that the rays which leave it must be parallel and consequently it must be emmetropic.

But it may happen that the myopic observer like the emmetropic cannot relax his accommodation, while using the ophthalmoscope. This will make him just so much more myopic, and instead of using, say $\frac{1}{2}$, which fully neutralizes his myopia, he will with the ophthalmoscope have to use, in order to bring parallel rays to a focus in his retina, $\frac{1}{2}$ or $\frac{1}{3}$. Under these conditions his eye is equivalent to a myope's of $\frac{1}{2}$ or $\frac{1}{3}$, whose accommodation is entirely relaxed. The observer will then know that when the eye under examination is seen clearly with this glass it must be emmetropic.

As the rays leaving the emmetropic eye will always strike upon the glass used as parallel, it is evident that the distance between the two eyes need not be here taken into account, and that, consequently, the observer may be one or more inches from the observed eye, as he pleases.

PROPOSITION II. *For a myope to determine the degree of myopia in the observed eye.*—If the observer does not wish to wear a correcting glass, which is often inconvenient and clumsy, the simplest way for him is to proceed with the examination just as an emmetrope would, and find by trial with what glass

he sees the fundus most distinctly, his accommodation being of course relaxed, and then to take into account the amount of his error in refraction; saying, for example, a myope of $\frac{1}{6}$ finds that he sees the fundus of the examined eye with concave $\frac{1}{3}$, what is the amount of M present?

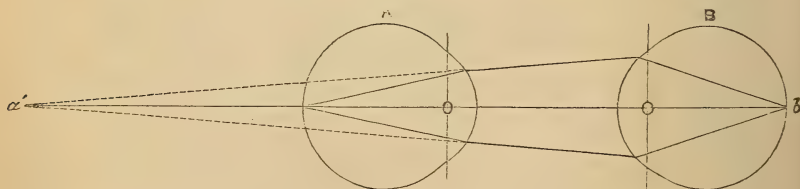
The observer knows that a part of this glass $= \frac{1}{6}$ is employed in neutralizing his own myopia; consequently to get the true glass through which the fundus would be seen independent of his error of refraction, he must subtract this $\frac{1}{6}$ from $\frac{1}{3}$ used, $\frac{1}{3} - \frac{1}{6} = \frac{1}{6}$. Now assuming the distance to be two inches, we have $\frac{1}{6} + 2 = \frac{1}{6}$. The amount of myopia in the examined eye is therefore equal to $\frac{1}{6}$, and a myope of $\frac{1}{6}$ will have to use $-\frac{1}{6}$ at two inches, in order to see the fundus clearly.

From this it will be seen that the myope of even a medium degree will have to use very strong glasses to see the fundus of an eye which is only moderately myopic. Now as ophthalmoscopic cases do not usually contain these strong glasses, it follows that the myopic observer must renounce in many cases examinations by the upright image.

By far the best way of avoiding this difficulty, is to have a small movable slide containing the proper glass fitted to the back of the instrument. This will not interfere with the use of the glasses ordinarily placed in the clip. There is no real disadvantage in seeing through two concave glasses; on the contrary, according to Maunther, an actual advantage over one very strong glass, inasmuch as the image by the use of the two weaker glasses is more aplanatic than where one strong glass is employed. The lessening in illumination is so small as to be of no consequence at all.

PROPOSITION III. *For a myopic eye to determine the degree of hypermetropia in a given case.*—Let A represent a hypermetropic eye of $\frac{1}{6}$; rays coming from the fundus of such an eye will diverge as if they came from a point eight inches behind the nodal point at a' . If now a myope of $\frac{1}{10}$ (B), places his eye two inches in front of the observed eye, then the rays which enter his eye will diverge as if they came from a point ten inches in front of his nodal point,

Fig. 6.



that is to say, his far point, and as his eye is just adapted for such rays, they will come to a focus on his retina, and he will get a clear view of the fundus without the use of any glass.

If the observer's eye is at four inches from the observed eye, then the rays which enter his eye will diverge as if they came from a point twelve inches in front of his nodal point, the observer will only have to be myopic $\frac{1}{12}$ to bring such rays to a focus. The hypermetropia in the observed eye is then always greater than the observer's myopia by as much as the observer's eye is distant from the observed. In the above case $H = \frac{1}{10} - 2 = \frac{1}{6}$. $H = \frac{1}{12} - 4 = \frac{1}{6}$.

If the hypermetropia in the observed eye is greater than the observer's myopia (the distance between the two eyes being taken into consideration), it is evident that the rays will emerge so divergent that they will no longer meet upon the observer's retina, but behind it. In order to bring such rays to a focus he must make himself so much more myopic. This he does by a convex glass which he finds by trial just as an emmetrope would. For example, a myope of one-eighteenth finds that he needs a *convex* $\frac{1}{18}$ to see the fundus distinctly. If he adds this glass he is no longer myopic $\frac{1}{18}$, but $\frac{1}{18} + \frac{1}{18} = \frac{1}{9}$. Now we have just found that the H equalled the M minus the distance, and as the $M = \frac{1}{9}$ th, we get $H = \frac{1}{9} - \frac{1}{9} = 0$.

The observer may in this case use his A instead of a lens, providing he can estimate the amount.

If, however, the hypermetropia in the observed eye is less than the myopia of the observer (the distance between the eyes being taken into account), it is evident that the rays emerging from the eye will be so little divergent, that the stronger myopia of the observer will cause them to meet in front of his retina. The observer must make himself less myopic in order to bring such rays to a focus on his retina; this he does by means of a *concave* glass. For example, a myope of $\frac{1}{6}$ can only see the fundus in a given case with $-\frac{1}{18}$, what is the H of the observed eye? By placing the concave glass before his eye, he has reduced his myopia so that he has no longer $M = \frac{1}{6}$, but $\frac{1}{6} - \frac{1}{18} = \frac{1}{9}$. As we have previously found that $H = M$ minus the distance, we have $H = \frac{1}{9} - \frac{1}{9} = 0$.

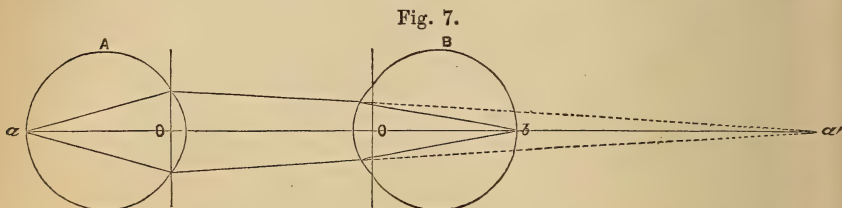
The observer being hypermetropic.

PROPOSITION IV. *For a hypermetropic observer to see an emmetropic eye.*—Inasmuch as the rays leaving an emmetropic eye are parallel, the observer, in order to bring such rays to a focus on his retina, will simply have to neutralize his manifest hypermetropia. If he is $H \frac{1}{12}$, then he will simply have to place a convex $\frac{1}{12}$ behind the mirror.

He may find, however, that with the ophthalmoscope he does not relax his accommodation. His hypermetropia, consequently, will be reduced by just the amount of accommodation which he is using. And he may find that instead of using say a convex of $\frac{1}{12}$, which fully neutralizes his manifest H , he will, with the ophthalmoscope, require only $\frac{1}{24}$ to bring parallel rays to a focus. Under these conditions his eye is in fact equal to a hypermetrope's of $\frac{1}{24}$, who can entirely relax his accommodation, and the observer will then know that an eye seen distinctly through this glass must be emmetropic. It may happen in this way that a person who is slightly hypermetropic for the distance, becomes for the ophthalmoscope emmetropic, and so has to use no glass at all; or even myopic, and then will have to use a slightly concave glass. For example, a hypermetrope of $\frac{1}{36}$ may find on account of his inability to relax his accommodation, that in order to see an emmetropic eye he needs a concave $\frac{1}{36}$. The amount of accommodation which he uses would then only be $\frac{1}{18}$ and many inexperienced observers use $\frac{1}{12}$. In this case the observer is virtually myopic, and must proceed as such.

The observer may of course use his accommodation in all cases instead of a convex-glass, that is to say, the lens in his own eye instead of one behind the mirror. He would, however, in this case have to know just what amount of tension of his ciliary muscle corresponds to a given glass.

PROPOSITION V. *For a hypermetropic observer to determine the amount of myopia in the observed eye.*—Let A be myopic $\frac{1}{8}$; rays of light coming from a will meet eight inches in front of A 's nodal point at $\hat{a}$. If B , who is hypermetropic $\frac{1}{8}$, places his eye two inches from A , then rays from A would meet, if uninterrupted, at a point just six inches behind B 's nodal point. Now as B 's



eye being hypermetropic $\frac{1}{8}$ is adapted for such rays, they will be brought to a focus on the retina. Consequently A 's myopia must be equal to B 's hypermetropia plus the distance, $M = \frac{1}{8} + 2 = \frac{17}{8}$. From this it follows that a hypermetrope of a certain degree can see the fundus of a myope of a certain degree without any glass.

If, however, the myopia of the observed eye is greater than the observer's hypermetropia, it is evident that the rays emerging from the eye examined will be so convergent that they will meet in front of the observer's retina; to bring them to a focus he must make himself more hypermetropic. This he does by means of a concave glass, which he finds just as an emmetrope does by trial. For example, a hypermetrope of $\frac{1}{8}$ finds that he, with his accommodation relaxed, sees the fundus distinctly in a given case with concave $\frac{1}{8}$, what is the myopia in the observed eye?

By putting the concave $\frac{1}{8}$ before his eye, the observer has made himself just so much more hypermetropic. He is consequently no longer hypermetropic one-eighth, but $\frac{1}{8} + \frac{1}{8} = \frac{1}{4}$. Now as the myopia in the observed eye is equal to the observer's hypermetropia plus the distance, we get $M = \frac{1}{4} + 2 = \frac{17}{4}$.

If, however, the myopia in the observed eye is less than the observer's hypermetropia (the distance between the two eyes also taken into consideration), rays emerging from the observed eye will not be convergent enough to meet on the retina, but behind it. To make such rays meet on his retina he must make himself less hypermetropic. This he does by a convex glass which he finds by trial. For example, a hypermetrope of $\frac{1}{8}$ sees in a given case with a convex $\frac{1}{8}$, what is the degree of myopia present in the examined eye? By adding the convex $\frac{1}{8}$ to his eye, the observer has reduced his hypermetropia, making himself no longer hypermetropic $\frac{1}{8}$, but $\frac{1}{8} - \frac{1}{8} = 0$. Now as the myopia equals the hypermetropia plus the distance, we get $M = 0 + 2 = 2$. Thus we see that a hypermetrope may, according to circumstances, in estimating myopia, use no glass at all, or a concave, or a convex one.

PROPOSITION VI. *For an hypermetropic observer to estimate the amount of hypermetropia in the examined eye.*—The best way in this case is for the observer to find by trial with what glass he sees the fundus most distinctly, and then to take his own error of refraction into consideration. For example, a hypermetrope of $\frac{1}{8}$ sees the examined eye with convex $\frac{1}{8}$, what is the hypermetropia present? The observer knows that a part of this, equal to one-

eighteenth, is employed in neutralizing his hypermetropia, consequently to get at the true glass which would be used independently of his error in refraction he must subtract this $\frac{1}{8}$. $\frac{1}{9} - \frac{1}{8} = \frac{1}{72}$. As the observer has thus neutralized his hypermetropia, he is virtually emmetropic, and knows that the H present must be equal to the glass used minus the distance. $H = \frac{1}{8} - 2 = \frac{1}{8}$.

ART. IV.—*Cases of Nerve-Irritation, cured by Surgical Operations.*

By JOHN H. PACKARD, M.D., of Philadelphia.

THE following cases, which occurred to me in the summer of 1869, seem to be of sufficient interest to warrant me in laying them before the readers of the Journal. I propose first to narrate them, and then to offer a few brief comments upon them.

In one of these cases there was irritation of the terminal filaments of the median nerve at the side of the last phalanx of the thumb; in the second, the trunk of the infra-orbital was the seat of trouble; in the third, the cerebrum itself was pressed upon. In all, the operations resorted to gave complete relief.

CASE I.—Miss E. N., æt. 11 years, was brought to my office on April 12th, 1869, with a very large splinter of wood under her right thumb-nail, at the ulnar side, which had been three days previously forced in while she was driving her hoop. A neighbouring physician had advised poulticing, to draw it out; but it was firmly imbedded, and pus had formed at the root of the nail, while the tension of the tissues gave rise to exquisite pain. She was suffering so much that her parents took her to Dr. F. G. Smith, their regular attendant, who sent her to me.

I at once sent her home, as soon as possible etherized her, and removed the splinter; making also an incision in the pulp of the thumb, where pus was beginning to form, which afforded very great relief. The wounds healed kindly, although the swelling was slow in subsiding.

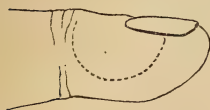
In July the child was again brought to me, suffering from very grave general symptoms of nervous irritation. She had choreic movements of the whole body, of all the limbs, and of the jaw; the right half of her person being somewhat more affected than the left. She had lost flesh and strength, was peevish, irritable, and unable to fix her attention on anything. Her appetite was very poor. Locally, there was sensitiveness of the affected thumb, which she could not use in grasping; thus she could not use her right hand at the table, or in writing or sewing.

By Dr. Smith's direction, she was using iron, quinia, and arsenic, and was soon to be taken to the sea-shore at Cape May. I advised also the constant protection of the thumb by a plaster containing the extracts of opium and belladonna.

On her return from the sea-shore she was somewhat improved in general health, but the irregular movements still continued, and with undiminished intensity. After she had been at home a few weeks, she began again to lose condition; and as there seemed to be one point of special sensitive-

ness at the ulnar edge of the thumb-nail, Dr. Smith agreed with me as to the propriety of attempting exsection of the nerve-filament involved.

Accordingly, on the 17th of October she was etherized by Dr. W. Sinkler, and with Dr. Smith's aid I dissected up a semicircular flap, as seen marked out in the figure; the nerve-filaments could not be distinguished, but I cut away the subcutaneous fat and areolar tissue, and then closed the wound.



Healing took place very readily. The child was noticed to be much steadier in a very few days; and this improvement continued until, about two

months after the operation, her choreic symptoms had totally disappeared. At the same time she gained flesh and strength; her appetite returned, and her temper became calm and natural. The tonics were still kept up until her health was quite restored, and then gradually withdrawn.

At present, February 7, the nail has almost entirely resumed its normal appearance, the thumb is scarcely at all scarred, and the child shows no sign of the threatening condition she was in four months ago.

CASE II.—Mr. P., æt. 59, was seen by me in August, 1868, at Superior City, Wis., on account of neuralgia of the right infra-orbital nerve, from which he had suffered most distressingly for twenty-four years; it seemed to have been brought on by exposure during his journeys as a land agent and surveyor, as well as in hunting. Otherwise his health was good; his habits were unexceptionable. He had no upper front teeth, but wore an artificial set; his gums were sound.

I advised the use of morphia hypodermically, and sent him out the syringe, &c., on my return home.

He called on me again in Philadelphia, Aug. 13, 1869; having experienced little or no relief. The daily hypodermic injection of morphia had become a necessity to him. In addition to this I ordered him, thrice daily, one-half grain of quinia, with one-third of a grain of arsenic, and one-eighth of a grain of extract of opium.

No change for the better taking place, Dr. D. H. Agnew saw him with me, and we decided upon exsecting a portion of the nerve. Accordingly, on the 30th of August, Drs. Agnew, Brinton, and Thomson being present, he was etherized by Dr. Sinkler, and I made an incision along the lower edge of the right orbit, and another downwards from its outer extremity, so as to dissect up a flap including all the tissues except the nerve and vessels. The latter being held aside outwards with a blunt hook, I applied the corner of a small trephine to the anterior wall of the antrum. Removing the button of bone, I broke away with nippers the bridge of bone between the orifice thus made and the infra-orbital foramen. Following the nerve backward, I broke away the inferior plate of the floor of the orbit (the roof of the antrum), drew the nerve down, and divided it as far back as I could. The wound was now stuffed with lint, a little oozing taking place, but no free hemorrhage; and in an hour I brought the edges together with harelip pins, and applied a cold water dressing. Before the anæsthesia had fully passed off, a hypodermic injection of 10 drops of Magendie's solution was given him.

For a day or two he had occasional severe "spasms," or twitchings of the facial muscles, on the right side. These, however, became less and less troublesome, and by Sept. 9, ten days after the operation, he told me he felt better than he had for a long time before.

On the 3d of October, he left for his home, entirely free from pain, but still depending on a daily hypodermic dose of 5 minims of Magendie's solution of morphia.

He wrote on the 30th of that month that he still felt perfectly relieved, but had not yet been able to dispense with the anodyne.

CASE III.—J. W., æt. 14, was admitted to the Episcopal Hospital Sept. 11th, 1869, having sustained a frightful injury of the head. He and his brother had been out in a boat shooting reed-birds, and as they were coming towards shore, the gun, which was in his brother's hands, was accidentally discharged, the load striking him on the top of the head, and knocking him into the water. He was soon dragged out, and brought to the hospital, a distance of several miles.

A very large portion of the scalp was torn completely off the top of his head, together with a patch of periosteum about two inches square; there was also a fissure of the bone, stellate, two of the cracks branching out an inch or more, the others very small. The two large cracks mentioned, formed an acute angle with one another.

At the time of his admission he was suffering greatly from shock, aggravated by the fact that his clothes had been wet during the two hours since the accident. Reaction, however, came on well, and his pulse became normal in frequency and fullness. The wound was covered with lint dipped in ice-water. During the night he was very restless, tossing about continually, although he seemed stupid and inclined to sleep.

It appeared that for three days he had suffered from an enlargement of both parotid glands, and had been supposed to have mumps; if this were so, the other symptoms soon became so grave as to overshadow this disorder entirely.

On the 12th, his condition was good, but the stupor continued. He was purged with Epsom salts, and counter-irritation used at the back of the neck and to the lower extremities. In the afternoon his bowels were opened freely, and he became less dull. He seemed to progress well until the 17th, when he was seized with convulsions, fifteen or twenty occurring in the course of the day. These convulsions affected mainly the right upper extremity; the eyes were twitched toward the right side, and the muscles of the face irregularly contorted. There was no congestion of the face, frothing at the mouth, nor biting of the tongue. There was erection of the penis. Each convulsion lasted a minute or more.

At 5 P. M. I saw him; and, finding that there was a spot at the apex of the angle between the two fissures before spoken of, pressure upon which induced convulsions, I applied the crown of a trephine at that point, and removed a button of bone, but made no further examination or attempt at elevation of the surrounding part. No ether was given, but he made no complaint. Immediately after the operation he had rather a strong convulsion, and several others of less severity occurred during the evening; but a very large fecal evacuation having taken place, he fell asleep, and passed a very good night.

No recurrence of the convulsions took place; the wound granulated well, and the outer table of the injured bone exfoliated, two very large plates coming away, by gentle coaxing, on the 20th of October. When put together these plates showed between them the trephine-hole.

Nov. 27th he was discharged, entirely well.

The first of the cases now detailed is obviously analogous to those of

tetanus, hysteria, epilepsy from peripheral cause, and hydrophobia. It is seldom, however, that in such instances the source of the trouble can be so readily detected and removed. Possibly the search is not always instituted with sufficient rigour in the more obscure cases.

In the second case, the long continuance of the irritation, the age of the patient, and the absence of any distinct morbid condition or history of injury, rendered the prospect of relief very slight. It has occurred to me that perhaps the trouble was due to thickening of the bony wall of the infra-orbital foramen, or of the canal, whereby the nerve was pressed upon. The excised portion of nerve, which was somewhat torn, presented no appearance of abnormality; it was not examined under the microscope.

The third case was, in my opinion, remarkable from the extreme severity of the lesion, the sudden onset on the sixth day of very grave symptoms, and their speedy disappearance after an operation which, although indicated and even demanded, seemed scarcely adequate to the production of benefit so immediate, so complete, and so permanent.

Pressure on nerve-trunks may induce very curious and obstinate lesions of the parts to which they are distributed, as I have several times seen. A most remarkable instance of this kind, in which the patient had not slept in bed for more than eight months, from the necessity of constant change of posture, a fibrous tumour at the back of the femur pressing on the sciatic nerve, and inducing enormous swelling of the whole limb, with eczema, burning pain, and acrid sweating, was reported by me to the Pathological Society of Philadelphia in 1863. (See this Journal for Oct. 1863, p. 406.) The tumour was excised with perfect relief, and the patient has remained perfectly well ever since.

In the same number of the Journal, p. 404, a case is recorded, reported by Dr. Agnew to the same Society, in which a small bursal tumour pressed on the median nerve, and caused total loss of power in the muscles supplied by it. Removal of the tumour gave entire relief.

1415 SPRUCE STREET, Feb. 1870.

ART. V.—*Case of Scleroderma or Sclerema, with the Autopsy and Remarks.* By WALTER DE F. DAY, M. D., of New York.

M. T. æt. 37; married; no specific history; a successful business man; fond of good living. Has been troubled for the last four years with dyspeptic symptoms; nausea and vomiting having been, occasionally, a source of much annoyance to him.

As early as October, 1868, he began to notice a peculiar burning and prickling sensation in his hands, in consequence of which he was induced to seek medical advice; and about this time was seen by several physicians,

by whom his disease was supposed to be of a rheumatic nature. In consequence of this view of his case, he was at different times placed upon the use of alkalies, the iodide of potassium, systematic rubbings, baths, electricity, and, it is supposed, mercurials.

When first seen by me, July 2d, 1869, the disease had progressed so far as to leave no doubt as to its nature. The skin of the hands, wrists, feet, and ankles showed well-marked sclerema. There was some increase of volume. The skin was dusky, and the fingers had somewhat of a waxy appearance. The parts affected were resisting to pressure, and as hard as a board. The movements of the fingers and toes were impaired to the extent of being almost lost; the result, apparently, of pressure, as the joints were unaffected. The face had a discoloured appearance, as if deeply tanned, was slightly cedematous, and without expression, owing to the stiffness of the skin. There was no loss of sensibility in the parts, though their temperature was lowered, and the patient experienced in them a *sensation* of coldness. Natural pleats and markings of the skin obliterated. Hairs upon the parts healthy; no interference with the perspiratory function, and no actual pain, though there was a sensation of tension in the parts. General condition anemic, as indicated by the colour of the prolabia and the venous hum. Appetite poor; much troubled by nausea; urine contained neither casts nor albumen. The patient was advised a generous diet, including the moderate use of alcoholics; was encouraged to ride out in pleasant weather; and was placed upon the use of a tenth of a grain of the phosphide of zinc, three times a day.

July 12. Sclerema has extended from the wrists and ankles to the forearms and legs, the skin even above the knees and elbows being so much stiffened as to interfere with motion, and to render walking difficult. Nausea and anorexia continue. Phosphide of zinc is discontinued, and I have substituted the citrate of iron and quinia. He is rubbed several times a day with neat's foot oil.

September 15. Scleroderma extended to the chest, abdomen, and posterior part of the trunk; in which last locality there is much hardening and increased pigmentation; no improvement in the appetite. Frequent nausea and efforts to vomit are still prominent symptoms. He is indisposed to exertion, and keeps the recumbent position most of the time. During the month the citrate of iron and quinia has given place to the elixir Calisaya, which, becoming distasteful, has been followed by three drops of Fowler's solution three times a day.

Patient soon wearies of his remedies, attributing to them his dyspeptic symptoms. He is encouraged to eat, and is allowed the moderate use of stimulants, ale, brandy, or champagne, in compliance with his taste as regards selection. His nausea is somewhat relieved by the occasional use of morphia sulphatis, gr. $\frac{1}{8}$. He complains of pain in the chest, due, apparently, to pleurodynia. There is no cough, but on auscultation I discover a fine, characteristic, crepitant râle, at the left apex, and extending over the precordial region. It is unconnected with other auscultatory signs; there is no dulness on percussion, and the râle, which has been observed for some time, is perhaps due, in some way, to the subcutaneous induration. The patient is, at times, sensible of its presence.

October 10. Mr. Ernest Hart, of London, and Dr. Warren Stone, of New Orleans, have seen the patient in consultation, and have concurred as to the propriety of the arsenical treatment. An alkaline lotion has been

applied to the lower extremities, but the occurrence of superficial ulcerations upon the parts has caused its discontinuance.

The above notes are taken from the case-book of Dr. Austin Flint, who saw the patient with me frequently in consultation during the remainder of his illness.

When I first examined the patient, October 11th, I found the whole cutaneous surface more or less affected, though the neck, shoulders, and organs of generation were relatively normal. The hands were hard, swollen, of a reddish, sometimes purple colour; fingers immovable and separated; much atrophy of the muscular system, with marked emaciation of the lower extremities, in which situation the skin had a smooth and varnished appearance, resembling much the colour of an old eczema of the legs. There were several superficial ulcers over the bony prominences about the knee and ankle-joints, due to the tension of the skin, rather than to external pressure. There was, however, a small bed-sore over the coccyx. Mouth could not be widely opened; mastication and deglutition difficult, though there was apparently no affection of the mucous membrane of the mouth. Arms and legs partly flexed, and no motion at the knee and elbow-joints. Patient unable to turn himself in bed, but, when lifted upon his feet, could take several steps with the assistance of his nurse. He was, at this time, taking $\frac{1}{2}$ gr. morph. sulph. at night, with the Fowler's solution, gtt. iij, three times a day. Two days afterwards, October 13th, he was attacked with purging and emesis, which lasted several days, during which time he vomited large quantities of a thin, dark-green liquid. The hypodermic injection of morphia was attempted on the arm and leg, but so dense was the subcutaneous tissue that the solution was not retained, and the skin of the neck was the only part sufficiently intact to retain the injection.

After this attack the patient's general condition was weaker. The arsenic was not resumed, and codeia, gr. $\frac{1}{2}$, was substituted for the morphia at night. He was much troubled with a feeling of oppression in his chest, and with acid eructations, for which he took for some time a mixture of bismuth, pepsine, and strychnia; and when these were repugnant, he returned to the elixir of Calisaya.

After this loss of liquid by vomiting and purging, there was a sudden and marked amelioration in the condition of the skin. It lost, in a great degree, its bronzed colour, became softer and more supple, and in several places could be moved upon the subjacent tissues. This improvement did not affect the hands. His strength began gradually to decline; nausea was only an occasional symptom, but he complained of much difficulty in swallowing, which added to his reluctance to take food.

November 10, the pulse went up to 130 per minute, and was feeble. There were no symptoms of organic disease of the heart, and the crepitant râle, to which the patient called my attention on my first visit, had disappeared. He complained of occasional paroxysms of gasping dyspnoea, which occurred especially at night, and frightened him, though they usually lasted but a moment, and were relieved by a change of position. A small slough, due to pressure, formed upon the right elbow, and at the same time the third finger of the right hand became discoloured, painful, and gangrenous, owing to the embarrassed circulation. A few days afterwards the corresponding fingers on the left hand presented a similar appearance; both hands being livid, as cold as those of a cadaver, and were only warmed by being kept upon hot bricks.

The condition of the skin continued to improve, but the heart's action remained frequent and feeble, the pulse ranging between 130 and 160. The tincture of digitalis was now given, for the purpose of stimulating the heart, and the peroxide of hydrogen was afterwards added, at the suggestion of Mr. Hart, with the hope of giving the blood more oxygen.

The patient, however, in spite of these remedies, and the support of beef-essence and brandy, grew steadily weaker, became delirious on the afternoon of November 27, and died quietly at 12.30 P. M. of the same day in a condition of coma.

Autopsy thirty-six hours after death.—Present, Drs. Flint and Kissam, Mr. Ernest Hart, and Drs. Janeway and Day.—Skin over the whole body tense, smooth, and scarcely movable; muscles of the chest and abdomen pale and much atrophied, and, in some parts, particularly upon the thorax, were in the state of granular degeneration; skin and subcutaneous tissue more closely bound together than usual, the latter containing scarcely any fat, and its connective tissue being abnormally dense.

Heart. Sac of the pericardium obliterated; pericardial surfaces adherent, partly from connective tissue, and partly from recent fibrinous exudation; pulmonary and aortic valves very slightly fenestrated at their margins; tricuspid and mitral valves normal, as were also the walls and cavities.

Lungs. Upon parts of the pleural surfaces of the right lung were recent fibrinous exudations, whilst other portions were attached by old tufted false membranes, and by recent vascular ones; space between the lower lobe and the diaphragm contained about a quart of serum, in which were floating some few flocculi of lymph; upper and middle lobes œdematous, and lower lobes somewhat compressed; pleural surfaces of the left lung adherent, and lung itself œdematous; both pleuræ costales somewhat thickened and opaque.

Abdominal Cavity. There existed in the peritoneal sac very general adhesions between the different viscera by means of recent fibrinous exudation and older connective-tissue growths. A slight amount of serous effusion was remarked.

Liver. Normal in size; cells about the intra-lobular veins contained brown and yellow granular pigment; otherwise this organ was normal, as were also the spleen, pancreas, stomach, intestines, and kidneys. The latter organs were examined microscopically. The supra-renal capsules were very fatty, on microscopical examination, giving the cortical layer a much brighter colour than usual.

Spinal Cord firm, and did not present, either as regards itself or its membranes, any lesion. A very careful microscopical examination of sections taken from different portions of the cord was made by Dr. Edward G. Janeway. The gray matter, its cells, their nuclei, and nerve processes were healthy. In every case the epithelium of the central canal was well preserved. In the white matter, however, the amount of connective tissue at the periphery was somewhat greater than normal, a condition more marked at the lower part of the cord. There was nothing abnormal in the nerve-fibres, their medulla, and axis-cylinders.

Sections of the skin, examined microscopically, were taken from the sternal, dorsal, and popliteal regions. No changes were observed in the horny epithelium, or in the rete mucosum, with the exception of a pigmentation of its deepest layer of cells. This pigmentation was very marked in the skin of the back and popliteal region, less so in that of

the chest. Papillæ and upper part of the corium presented no lesions; small vessels and capillaries normal, but contained an unusual quantity of blood; the sweat-tubes, hair-follicles, and sebaceous glands healthy. In the deeper portions of the derm there was an abnormal increase in the quantity of fibrous tissue. This increase was gradual, and there was no decided line of demarcation between the corium and the subcutaneous connective tissue. Deeper still, the field was entirely occupied by bundles of dense fibrous tissue, crowded closely together, and intermingled with elastic fibres, which, also, were increased in quantity. The bundles ran, for the most part, parallel to the surface of the skin, but were interlaced so that, in sections, some bundles were cut longitudinally, others transversely, and others diagonally. It was this enormous development of fibrous tissue which accounted for the abnormal thickness and toughness of the skin. Here the convoluted sweat glands, though the subject of no further pathological change, were crowded into spaces too small for them, and took an oval shape.

The subcutaneous adipose tissue existed in very small quantity, and was crowded into oblong spaces between the layers of fibrous tissue; fat-cells, much shrunken, had lost their rounded form, and showed the nucleus plainly.

Scleroderma, or, as it is sometimes written, sclerodermia, has several synonyms, such as sclerema, scleremia, scleremus, scleria, scleriasis, scleroma, sclerosis, and sclerysmus, all owing their origin to the Greek word, σκληρός—"hard."

The first undoubted case of which we have any knowledge was observed by Curzio, in 1755, and another fell to Henke, in 1809. The literature of the disease dates from an article by Thirial,¹ entitled "*Du Schlérème chez les adultes*," which appeared in 1845. Single cases appeared from time to time, mostly in France, until Gilette,² in 1854, collected twelve cases from other writers, and added two new cases, one of which occurred in his own practice. In 1861, Arning³ reported a case of his own, with a *résumé* of eighteen others; three years after which, Köbner⁴ published an account of twenty-nine cases. Some eight others were subsequently added by as many different observers, mostly German. A very interesting and detailed account of a case, making the total number forty, was published by Rasmussen,⁵ of Copenhagen, in 1867, being the only one which had ever been observed, or, at least, described in Denmark. Three cases were reported by Dr. A. B. Arnold, of Baltimore, in the July number of this Journal for 1869.

¹ L'Union Méd., Dec. 1845.

² Archives Générales, 1854, p. 657.

³ Würzburger Med. Zeitschrift, bd. 2, p. 186.

⁴ Klinische und Experimentelle Mittheilungen aus der Dermatologie und Syphilidologie: Erlangen, 1864. p. 33.

⁵ On Sclerodermia and its Relation to Elephantiasis Arabum. By Dr. Vald. Rasmussen. Translated by William Daniel Moore, M. D. Edinburgh Med. Journal, July—December, 1867.

If, therefore, no cases have been overlooked, the present one makes the forty-fourth recorded, and the autopsy is the seventh.

Many systematic writers upon Dermatology have given interesting analyses of the different cases of this disease. Among others, which will repay perusal, is an article by Gintrac (*Cours Théorique et Clinique de Pathologie Interne et de Thérapie Médicale*. Tome Cinquième). And another by C. Hilton Fagge, in *Guy's Hospital Reports* for 1867.

Rasmussen's case is especially important, because the disease presented itself in different stages at the same time, and on account of the author's theories based on very careful microscopical investigations. The disease occurred in a healthy married woman, æt. 46, and began by the formation of several small knobs in the right breast, which gradually contracted into a hardened mass. There was no pain in the breast, but soon afterwards violent pains occurred in the right arm, where an erysipelatous redness and swelling soon set in, extending over the whole arm, which was twice its natural size, and down upon the trunk. This erysipelatous condition extended gradually over the left breast and arm, was attended with the formation of sudamina and bullæ, an abscess formed in the right axillary region, and another in the calf of the left leg, the fever being high and almost of a typhus character. After a three-months' stay in hospital she was discharged cured, but shortly afterwards, without any pain or febrile disturbance, the disease returned. On readmission to hospital, the skin of the whole anterior portion of the right breast, and thence extending over to the left side, where the right half of the left mamma was involved, was considerably hardened, especially on the right breast, where it was strongly adherent to the subjacent parts, with a considerable *contraction* of the subcutaneous connective tissue. On the left side the hardness was less, and there was some *swelling* of the subcutaneous connective tissue. The right breast was reduced to a small tubercle of bony hardness, the left was about the natural size, in both, the nipples were retracted. This implication of the skin extended, with the same features of hardness and immobility, over the scapular, axillary, and right lateral regions. The whole of the right arm was swollen to about double its normal size. While under treatment for this disease, the patient was attacked by pleuritis, which terminated fatally.

On cutting through the right mamma, the skin and the subjacent tissue were found to be changed into a dense, fibrous, whitish substance, without any perceptible difference between the corium and the subcutaneous tissue, only some small reddish-yellow acini of fatty tissue remaining. The whole sclerotic mass had a thickness of rather more than an inch and a half. In the most affected part, corresponding to the third and fourth ribs, the intercostal muscles had wholly disappeared in the fibrous mass.

The right and left pleuræ, both costal and pulmonary, were thickened, and studded in spots with little tubercles, from the size of a hemp-seed to that of a pea, and of a dense fibrous consistency. The pleura costalis of the right lung was especially thickened, where it corresponded to the region of the third and fourth ribs, in which place it was in direct connection with the external formation of connective tissue. The right pleural cavity contained about four quarts of a thin, blood-coloured fluid, which had so strongly compressed the right lung that it could be easily grasped in the hand.

There was nothing especially noticeable about the different organs, the interest centring in the microscopical appearances of the skin.

In the cells of the rete lying nearest to the papillæ was some deposition of pigment. The corium was rather broader than usual, with tolerably abundant, fine elastic filaments. The meshes in the subcutaneous connective tissue were diminished in extent, especially in the superior layer, whose interior was devoid of fat, traversed by a fine network of filaments of connective tissue considerably larger than normal. By far the most interesting feature, however, was "a considerable development of cell-broods around the vessels in the skin and the subcutaneous connective tissue, so that the vessels were surrounded with sheaths." These were formed exclusively of closely impacted cells, which, for the most part, presented the appearance of lymph-cells. The sheaths completely covered the vessel itself, and were not removable by brushing. On transverse section they often appeared two or three times thicker than the vessel itself. This development of adenoid sheaths around the vessels was not absent in a single section from the arm, but in sections from the right and left mamma a difference was observed—least between the arm and left mamma—but more between the arm and the highly atrophic and hard right mamma. In sections from the breasts the sheaths around the vessels were slight, and in many sections they were not seen at all.

Rasmussen believes that too much stress has been laid upon the sclerosis, which is certainly the most striking feature, both to patient and observer, but which he believes to be only the final stage of the disease. He divides the disease into two stages, of which the first is one of infiltration (lymphatic œdema, Virchow) in the skin and subcutaneous tissue, with the formation of lymphoid cells in the surroundings of the vessels; and the second is the proper sclerosis, from the development of connective tissue from these cells. He admits that the stage of infiltration is very seldom so characteristically defined as in his case, where the arm was swollen to twice its natural size with increased heat and redness, but claims that this stage is well marked in a not very small number of earlier observations. He believes that the sclerosis must in all cases be preceded by infiltration, and that with this there must be a temporary swelling of the parts. He has discovered the same sheathed condition of the cutaneous bloodvessels in sections of two specimens of Elephantiasis Arabum, the only difference being that the formation of the lymphoid sheaths around the vessels was on a much greater scale in Elephantiasis, and reached quite to the capillaries, which was never observed in sclerema.

From these observations he believes himself justified in concluding that the two diseases depend upon one and the same process, and that they are, in essential points, identical. He suggests as a reason why other investigators have not observed this peculiar development from the sheaths of the vessels, the fact that the few cases in which there have been opportunities for microscopical investigation, have been in an advanced stage. This is partly borne out by the differences between the swollen right arm and the hard atrophied right breast, the lymphoid sheaths abounding in

sections from the former, while in the latter they were very rare, and often wanting altogether.

The other fatal cases are those of Förster, Köhler, Gintrac, Auspitz, and Arning.

Förster's patient died of pulmonary phthisis. The sclerosis was found in the upper part of the chest, the abdomen, and the anterior surfaces of both upper and lower extremities; the skin being in locations yellowish or brownish, extremely hard, and as difficult to cut through as sole-leather. The corium was somewhat thickened by hypertrophy of its normal connective tissue, but the subcutaneous membrane had not disappeared, being altered to a uniform, firm layer. There was no fat in the meshes of the connective tissue, and the walls of the meshes themselves were greatly increased by thickening and further development of their fasciculi, so that the loose meshy connective tissue was changed into a firm compact mass.

The elastic filaments of the skin and subcutaneous tissue likewise took part in the process. The papillæ of the corium, the cutaneous glands, and the hair follicles were unaltered, though the latter were unusually scanty. The capillary vessels were fewer than usual, but were otherwise healthy, and the nerves were entirely covered by the increased connective tissue. It should be mentioned that the body was extremely emaciated.

Köhler's is much like it, so far as the anatomical changes in the skin are concerned. The sclerosis was most strongly marked in the deeper layer of the subcutaneous connective tissue. This, with the corium, formed a firm, shining, tendinous tissue. There was very little fat, but a great increase of the subcutaneous bundles of connective tissue.

Auspitz's patient died of Bright's disease, supposed to have commenced after the scleroderma. The skin affection was extensive, but not very intense. There was a remarkably great development of bundles of connective tissue, the true elastic fibres being much increased; the subcutaneous connective tissue was moderately increased; the fat was rather less than usual; the rete mucosum was extremely high coloured, and the pigment was found even in the epithelium of the sudoriparous and adipose follicles.

In Arning's case the anatomical change consisted in an enormous development of elastic tissue in all the affected parts. The thickening was chiefly confined to the corium, the subcutaneous connective tissue not being implicated excepting on the face and neck, where it had coalesced with the superficial fasciæ, forming a cicatrix-like mass, which extended to the bone.

Gintrac's case I have not had access to, but it is said not to differ essentially from the others.

The etiology of this disease is obscure. There seems to be nothing in hereditary transmission, temperament, occupation, previous diseases, food or habits of life to which we can well attribute it. A number of cases have been immediately preceded by exposure to cold while the body was heated, and the disease in these instances has sometimes progressed so rapidly as to suggest the exposure as a cause.

Henke's case. A girl, æt. 24, went to sleep in the middle of the day in a cool cellar, on some damp grass, and on waking, found her neck stiff from rigidity of the skin of that region. This was the beginning of her

diseasè. Bouchut's case. A man exposed to a draft while in a perspiration found the next day his movements much impeded, and in four days the whole upper half of the body was perfectly hard.

There are a number of similar cases. As to age, it is a disease of middle life. In thirty-nine cases where the age is mentioned it has occurred twenty-four times between the ages of 18 and 35 years; only four times before that age, and only eleven times after the fortieth year.

As to sex, out of the forty-four recorded cases, thirty-one have been women and thirteen men. It has oftener begun upon the upper part of the body, but sometimes attacks other parts indiscriminately, either successively or simultaneously. Its invasion is usually insidious; often announced by prickling, creeping, or burning sensations, or by an occasional feeling of stiffness in the parts, and its course is generally chronic, lasting months and sometimes years. Sometimes, however, as in the cases just mentioned, it occurs suddenly, as it did also in Rilliet's case. A girl *æt.* 9, complained of a sudden pain in the epigastrium, accompanied with intense palpitation of the heart, and the physician found the epigastric region as hard as a piece of wood. The next day the induration attacked all parts of the body. In this case the tongue was thickened, and there was a slight effusion into the right pleura and pericardium.

The disease, even when extensive and chronic, is not necessarily incompatible with a perfect condition of the general health. Where the thorax and abdomen are implicated, respiration is sometimes laboured, and impletion of the stomach is a source of annoyance. The menstrual function is not always interfered with, though it is sometimes suppressed. In one case—Trousseau's—the checking of the flow by getting wet was almost immediately followed by the disease.

The urine is not albuminous, excepting temporarily, and very rarely in any case. Diseases of the heart have been sometimes present, but are believed to have been accidental complications. The sensibility of the parts is generally normal, as is also the transpiration. The temperature is often decreased, but this is not invariable. The disease is not inconsistent with other cutaneous affections, such as acne, eczema, urticaria, and even variola. As regards the discoloration of the skin, it usually exists to a greater or less extent, but the whole body is rarely equally affected. It may be yellowish, yellowish-gray, dark-brown, or it may even be decolourized.

As regards the termination, ameliorations are not uncommon, cures are not unknown, but the disease is apt to become inveterate. When death occurs it is usually by some complication.

The treatment has been quite varied, and has consisted of vapour baths, alkaline baths, baths of the sulphate of iron, baths with a decoction of conium, and even mud baths, with the internal administration of mercury, iodine, iodide of potassium, and kermes mineral. Mosler's treatment, which is at present most in favour, consists in a supporting diet, iron and

cod-liver oil in large doses, vapour and chalybeate baths, and inunctions with a salve consisting of black oxide of copper 3ij, glycerine 3j, lard 3j.

All authorities agree that we are not to be very sanguine as to the results of this or any treatment when the disease is far advanced, or where large portions of the skin are affected, and the general health is deteriorated. The number of cases treated are so few, and our knowledge of the natural course of the disease so limited, as to leave it doubtful whether the improvement which has been sometimes observed was due to accident or to the remedies administered.

ART. VI.—*Clinical Notes on Chloral.* By J. M. D ACOSTA, M. D., one of the Physicians to the Pennsylvania Hospital.

THE value of any new remedy can only be established by the concurrent testimony of independent observers, and by examining with critical care those points essential to the proper appreciation of its action. It is in this spirit rather than in that of an attempt to write fully on the subject that I record some observations made, and the reflections they gave rise to, while employing both in hospital and private practice, an agent now attracting much attention—the hydrate of chloral.

This article, as is well known, was discovered by Liebig in 1832, and was obtained by the action of chlorine upon absolute alcohol, hence its name chloral. Its chemical properties have been carefully examined by Dumas, Regnault, Kopp, and Wurtz, but Liebreich first studied its effects on animals and on man, and introduced it to our notice as a therapeutic agent.

Hydrate of chloral (C_2HCl_3O) crystallizes in snow-white needles, has a peculiar somewhat penetrating odour, and dissolves largely in water without being decomposed. It can be administered only in aqueous solution, but may be given by the stomach, the rectum, or hypodermically; its bitter and acid taste can be disguised by the addition of mucilage or syrup, particularly the syrup of orange-peel. It is incompatible with the alkalies. The solution for hypodermic injection should be neutral; if slightly acid, it may be neutralized by ammonia. The hypodermic method, however, had better be avoided, as painful phlegmons sometimes ensue upon its use. Yet, on the whole, I have found this but rarely happen, though I have known swelling and pain lasting for a month after the operation. The solution of chloral is said to alter in its composition by keeping, becoming inert or dangerous, therefore it should be prepared in small quantities only.

It is claimed for this new agent that it produces deep and prolonged

narcotism with perfect safety, that its hypnotic effects are unattended with excitement or restlessness, that neither headache nor any other unpleasant symptom follows the deep sleep it causes, that it quiets pain, and may remove sensibility so completely that painful operations can be performed while its action lasts without rousing consciousness, and that it lowers the animal temperature and occasions extreme muscular relaxation.

I have studied these points with more or less completeness on between forty and fifty persons to whom I have given chloral for various therapeutic purposes, and shall here record my general results and impressions, premising that the chloral employed was obtained from different sources, care however being taken to get it only from such that no doubt could exist as to its being a pure article. Moreover, one specimen, similar to the one used at the hospital at which a number of the observations were made, was tested by Liebreich's test, and was found, as he states, to render a solution of caustic potassa milky, bubbles of chloroform were given off, and the solution in a few minutes again became clear.

The average dose of chloral is from 20 to 40 grains by the mouth, and about 15 grains hypodermically. It may be administered in much larger doses in certain cases; on the other hand, it may produce striking effects in smaller doses frequently repeated.

As regards the *hypnotic influence*, I have not seen any from chloral in doses under 20 grains. In that dose it acts fairly in some persons; while others require several such doses to produce sleep. This dose may, however, be sufficient even in cases of confirmed insomnia. Thus, a case of typhoid fever occurring in a male æt. 35, admitted into my ward at the Pennsylvania Hospital, had advanced to convalescence when insomnia set in; his natural sleep lasted only three hours. 20 grains of chloral were administered and the patient slept soundly for six hours. The next morning he felt refreshed, had no headache, no diminution of appetite; the bowels were apparently uninfluenced. The chloral was continued for several nights and then suspended for three days; the insomnia returned, though in a diminished degree, and was again entirely relieved by 20 grains of chloral given at bedtime. Generally, however, for the relief of sleeplessness much larger doses are required, and in one patient nothing less than 60 grains, given in 20 grain doses every hour at bedtime, produced any effect. Thus administered, the insomnia yielded and refreshing sleep was produced, but the remedy had to be repeated on several occasions. These remarks are based on what I personally know of the drug; but a medical friend has mentioned to me a case in which 10 grains produced in a young adult deep slumber for ten hours; and, altogether, it has become evident to me, that even allowing for the varying degree of purity of the article employed, there is very great difference in the susceptibility to the agent, a much greater difference even than in the case of the ordinary neurotics.

The character of sleep is generally sound, but in the exceptional cases the patients are apt to be disturbed by vivid and oftentimes unpleasant dreams, as is well illustrated by the case of a man aged 32, who was under my care in the Pennsylvania Hospital, for acute rheumatism. He took by the mouth 30 grs. of chloral, and soon after fell asleep, dreamed a great deal, and his dreams were distressing and so vivid as occasionally to awaken him: on another occasion, however, he took 10 grains hypodermically, slept the entire night, and dreamed but very little.

In a hysterical lady, screaming in her sleep was noticed in addition to the above-mentioned symptoms of restlessness. The uneasy dreaming and excitement were observed in cases which took average doses, from 20 to 30 grains. Very large doses given at once may obviate the disturbance, but owing to the already mentioned individual peculiarity, prudence forbids large doses without knowledge of how they may affect the patient.

The pupils during the chloral sleep are apt to be contracted as in natural sleep; and the sleep, when the medicine acts well, is generally quickly induced.

The chloral sleep has been asserted to be attended by hyperæsthesia; I have not observed this, yet but few accurate observations were made on the point.

Anæsthesia does not result from ordinary doses; doses quite sufficient to produce sound sleep, and during which pricking or puncturing the skin of the sleeper did not fail to arouse him. The loss of sensibility is, I think, only likely to be the effect of heavy, and therefore possibly dangerous doses.

Generally speaking, the patient awakes naturally, and without mental confusion; occasionally, there may exist slight frontal headache, and also nausea and pain at the pit of the stomach. In a few cases, I have observed an unsteadiness of gait, resembling that of alcoholic intoxication; and a free action of the skin, which may in truth be quite exhausting and may show itself while the patient is still asleep as profuse sweating. On the whole, therefore, my experience with chloral is, that it has decided hypnotic powers, but that its action is not always the same, and that the statements that it induces sleep speedily and without previous excitement, that the sleep is calm and not followed by any unpleasant effects, are statements to which in practice numerous exceptions will be found.

Concerning the *influence on the secretions*, it may be said that chloral has no very obvious influence on the bowels; it may occasionally relax them. The urinary secretion, so far as I have tested it, was found to be augmented in quantity. It has been asserted that twenty-four hours after awakening, the urine of those who have taken chloral reduces the salts of copper; that, therefore, a condition of urine resembling a temporary glycosuria is produced. On this point I have made no observations.

The pulse is noticed to decrease in the number of its beats; at least it

does so some time after the remedy is given. The *respirations* are unaffected or but little changed; and the *temperature* is, as a rule, but slightly altered by ordinary doses, such as are quite sufficient to induce sleep. Where a diminution of the temperature has been especially observed, large doses have been given. Thus, in a case noticed by my colleague, at the hospital, Dr. Hutchinson, a single dose of fifty grains lowered the temperature $1\frac{1}{2}$ degrees within one hour.

What the effects of the remedy, given in moderate doses, upon the pulse and temperature are may be seen from these cases, recorded at the Pennsylvania Hospital, and chiefly under the direction of the resident physician, Dr. Van Harlingen :—

Wm. S. Lead colic. Observations made Jan. 7, 1870. Chloral grs. x hypodermically at 8.10 P. M. Skin cool and dry; pupils normal; pulse 90; respirations 24; temperature 99. 9 P. M. Pulse 78; respirations 18; temperature 100.5. Skin, etc., same. 10 P. M. Feels no pain, quiet and sleepy; pulse 70; respirations 18. Slept several hours.

Same case. Jan. 10, 1870. 7.30 P. M. Chloral grs. xv hypodermically. Pulse 104; respirations 16; temperature 101. 8.30 P. M. Pulse 86; respirations 16; temperature 100.4. Slept several hours.

Same. Jan. 11, 1870. Chloral grs. xv hypodermically. 7 P. M. Pulse 96; respirations 16; temperature 100.5. 8 P. M. Pulse 82; respirations 16; temperature 99.5. Slept eight hours.

Same. Jan. 12, 1870. Chloral grs. xv hypodermically. 7.30 P. M. Pulse 96; respirations 16; temperature 101.5. 8.30 P. M. Pulse 84; respirations 16; temperature 101. Slept seven or eight hours and felt no pain.

Frances M' C. Chronic rheumatism. Jan. 24, 1870. 6.30 P. M. Skin natural; sensibility good; pupils normal; pulse 60; respirations 20; temperature 100. Chloral grs. xv hypodermically. 7.30 P. M. Sensibility not diminished; pupils normal; pulse 64; respirations 24; temperature 100. Slept ten hours.

John T. Chronic rheumatism. Jan. 24, 1870. 6.40 Sensibility good; pupils normal; skin natural; pulse 90; respirations 20; temperature 100. Chloral grs. xv hypodermically. 7.30. Thinks he feels a little numb. Skin natural; pupils normal; pulse 90; respirations 20; temperature 100.

Wm. McM. Cerebral softening. 6.45 P. M. Skin warm and dry; sensibility good; pupils dilated; pulse 80; respirations 22; temperature 99.5. Chloral grs. xv hypodermically. 7.30 P. M. Pulse 86; respirations 20; temperature 99.5. Slept four hours.

Frank S. Abdominal tumour. Jan. 28, 7.30 P. M. Skin, etc., normal; pulse 84; respirations 24; temperature, 99. Chloral grs. xv hypodermically. 8.30 P. M. Pulse 84; respirations 26; temperature 99.

Jas. B. Rheumatism. Jan. 28, 7.30 P. M. Pulse 100; respirations 22; temperature 101.5. Skin, etc. normal. Chloral grs. xv. 8.30 P. M. Pulse 96; respirations 20; temperature 100; otherwise same. Slept seven hours.

But to turn from a consideration of its sleep-producing properties, and its general mode of action to its therapeutic applications, we find this powerful sedative of value in great restlessness, in hysterical excitement, in

acute mania, and in delirium tremens. With reference to the latter point I may, however, state that I have employed it in ten cases, and that my impression from watching the effect of the remedy closely is that it is rather a valuable adjunct to treatment than one which by itself will suffice to overcome the malady. It would be tedious to give the cases in detail ; but in some of them 90 to 150 grains of chloral taken in twenty-four hours in 30 grain doses produced no effect, nor was the desired effect obtained even when the drug was continued ; in others a single dose of one drachm given at night time for several nights neither abated the delirium nor produced sleep ; in another, the note says, that "after taking 30 grains of chloral every third hour for twenty-four hours he was still delirious, and a single dose of one drachm then being ordered he slept a little during the night, and while awake seemed quieter ;" in yet another, the record states, that "after a hypodermic injection of 15 grains he grew violent and unmanageable, and had to be strapped to the bed, while after raving all day one-fourth of a grain of morphia employed in the same manner procured considerable sleep." But these were all severe cases ; in lighter cases, or towards the termination of the case, I have seen chloral do good ; and even in one very severe case it answered better than opium, though not until the patient had used upwards of two drachms. The best results I have seen from it occurred in checking the hallucinations of the beginning disease and warding off its violent outbreak. Thus, in a broker excited alike by a gold speculation and by hard drinking, 60 grains of chloral acted very happily, whereas morphia did not.

Chloral relieves pain, and is therefore a remedy of value in neuralgia, gastralgia, and in various forms of colic. In lead colic it is very serviceable, as is shown by a case admitted into my ward at the Pennsylvania Hospital. The patient, æt. 49, had been employed in grinding white lead in a paint factory. He was suffering from severe colic with constipated bowels, constant headache, and dimness of vision ; aching pains in limbs, and inability to extend his wrists, and had a well-marked blue gingival line. There was also frequent nausea and vomiting ; abdominal pain was aggravated by food. Ten grains of chloral were ordered by the mouth ; he took three doses at short intervals, each dose relieving the pain and enabling him to sleep for an hour. After the effects of the medicine passed off, the pain returned. On the succeeding day he had two doses during the day and a hypodermic of ten grains. After both doses by the mouth and the hypodermic injection he was free from pain, and slept for about the same length of time as previously. Hypodermic injections of 10 grains were continued morning and evening ; they relieved the pain and insured a good night's sleep. They caused neither headache nor nausea. Slight diarrhoea came on, but I cannot say that it was due to the chloral.

The action of chloral in alleviating pain is, however, not constant. Thus,

in the case of a lady with abdominal neuralgia and uterine disorder chloral produced heavy sleep without arresting the pain; whereas opium, in ordinary doses, always relieved the pain, but caused nausea and marked excitation.

With reference to the action of chloral on coughs, I may state that some irritative coughs are benefited by it, but taken altogether I have not been struck by its efficiency. Nor did it do any good in the only case of asthma in which I tried it. I have also been disappointed in its use in hiccough, and in chorea. Thus I gave to a girl ten years of age who had this disease in a marked manner first 5 grains and subsequently 10 grains of chloral every fourth hour, and though it made her sleepy, I observed after a week's treatment no decided change in the irregular muscular movements.

As with every new remedy it will doubtlessly be tried for very many complaints, but it is important to know that this powerful agent is not devoid of danger, and as its influence upon the various diseased conditions has not yet been thoroughly studied we should, in every case, administer it in tentative doses and carefully note its effects. It is, I am sure, contra-indicated in some diseases of the heart, and ought not to be prescribed for patients with feeble heart. This I learned particularly from the case of a man aged 44 who was admitted into my wards at the Pennsylvania Hospital suffering from dilated heart with mitral disease. On account of wakefulness a twenty grain dose of chloral was given, it caused but little sleep, and the pulse became very feeble and much more irregular than it had been. A sphygmogram gave a sinuous trace precisely similar to Fig. 1. The chloral was stopped and in two days the pulse had grown as it previously was; its sphygmographic record is shown in Fig. 2; the stronger line of ascent is particularly obvious.

Fig. 1.



Fig. 2.



On the same day 30 grains of chloral were administered at bed-time; it produced but little sleep and the pulse again became feeble and very irregular, giving the next morning the sphygmogram shown in Fig. 1; the pulse improved as before slowly. Nor was the action of the remedy only perceptible in the irregular and faint pulse; other signs of feeble circulation appeared—coldness, giddiness, staggering, and great faintness.

The unpleasant and dangerous action that this case illustrates happens particularly in instances of feeble heart or of much obstructive disease. In cases of simple hypertrophy there is not the same danger.

Some of the unpleasant effects of the drug can be avoided by the simultaneous administration of opium. Indeed, using the two remedies together, and this remark does not only apply to cardiac cases, I think is often a decided advantage. I found it so in some cases of delirium tremens and also where I have wished to quiet pain. The excitement and nausea of opium, and the constipation it causes, are favourably influenced by the action of chloral, which again seems to have its powers increased by the opium. Thus these articles are not antagonistic, but may be made to aid each other; much in the same manner as we sometimes find the simultaneous or previous administration of bromide of potassium to prevent the evil effects of opium in persons with whom it disagrees.

In reviewing now the various applications of chloral and its mode of action, we cannot help being struck with its similarity to chloroform. Indeed, some of the most eminent observers believe that chloral is decomposed by the blood, as by any alkaline fluid, and chloroform set free; and distinguished chemists—Dumas among them—have found the chloroform in the blood.

In conclusion, I may record my belief, drawn from studying the action of chloral, that it is an important addition to our therapeutic means—chiefly, however, as a hypnotic. Its action as a destroyer of pain is limited; nor do I think that it can compete with ether or chloroform to produce the insensibility requisite for surgical operations. Its chief value seems to be that of an auxiliary to opium, or to take its place when opium is not admissible. It is, however, not so certain; nor is it ever likely to displace that peerless drug, of which Sydenham declares that without it Medicine would be as a cripple.

ART. VII.—*Case of Stricture of the Œsophagus in which Gastrotomy was performed.* By F. F. MAURY, M.D., one of the Surgeons to the Philadelphia Hospital; Lecturer on Venereal and Cutaneous Diseases in the Jefferson Medical College.

In July, 1868, I was consulted by H. D., æt. 25, who on the previous 17th of May, while at dinner, was suddenly seized with choking sensations and a violent fit of vomiting. He had partially finished his meal, and the matter ejected consisted merely of the food which had been last swallowed. Violent retching continued for nearly half an hour. For several days after, he experienced no difficulty in deglutition, and the incident just detailed had almost passed from his mind, when he was again attacked by similar symptoms, although more severe and prolonged. These paroxysms soon recurred almost daily, and he noticed that upon swallowing his saliva, it shortly afterwards rose in his mouth and necessitated constant expectoration. Deglutition at times was readily per-

formed for several consecutive days, and during these periods of respite he ate voraciously. Again, for prolonged periods not a morsel of food could be retained for more than a few moments, although his efforts to do so were persevering and repeated. His diet consisted solely of broths, soups, and an occasional glass of wine, and if a few ounces of these articles were retained, he congratulated himself. He had previously weighed one hundred and eighty pounds, and was a strong hearty man, but he now began to emaciate and lose strength.

In July his condition was such as to induce him to seek my advice. Stricture of the œsophagus was at once suspected, and upon exploration with a gum-elastic bougie, a diminution in its calibre was readily detected near its cardiac orifice. At the first examination an instrument, somewhat below the medium size, was introduced into the stomach; but at no subsequent period could even a small one be made to pass the stricture; so that efforts to dilate it proving abortive, all procedures having this end in view were finally abandoned from fear of doing harm. The matters vomited consisted solely of what the patient had ingested. There was no history of cancer in his family, nor had any irritating substances ever been swallowed. There was a feeling of constriction and suffocation upon the ingestion of food, and if the article taken had any bulk, the patient seemed to recognize the spot where it was arrested as being somewhat above the stomach. He suffered no pain at the seat of stricture, neither could it be elicited by firm pressure or smart blows. Upon close interrogation he acknowledged having had, at the age of seventeen years, an indurated chancre and buboes, which were subsequently followed by a papular eruption.

At the man's earnest request the probable issue of his case was candidly stated, but at the same time the possible benefit that might accrue from treatment was pointed out. The main indication was to sustain strength; and iodide of potassium and bichloride of mercury were exhibited, rather with a faint hope that they might act specifically, than with any conviction that they would produce any material change at the seat of stricture. Several attempts were made to pass a tube into the stomach for the purpose of introducing food, all which proving unavailing, they were finally desisted from.

After the first of January, 1869, the tortures under which the poor fellow had been labouring were aggravated, and those precious moments when he could allay in a measure, however slight, the agony of unsatisfied hunger, were of rarer occurrence. Emaciation had become extreme. There was gradual failure of strength until, in the early part of April, prostration was so great as to confine him to his bed, from which he could not rise without assistance. He was unable to perform the most trivial act for himself, and was as helpless as a child. Agonizing and most persistent pain, depriving him of all rest both by night and day, now set in. Its seat was principally in the extremities, more especially along the superficial surfaces of the tibiæ, although referred, indeed, to the whole osseous system. It was of a dull, heavy, aching character, and unbearable upon the slightest pressure. His condition was very precarious for three weeks, when he began to rally, and he became able, after persevering efforts, to swallow small quantities of liquid food. He gained sufficient strength to leave his bed, and even went out into the open air for short walks. But this amelioration was of short duration.

About the middle of May he could no longer swallow anything, how-

ever minute in quantity. Brandy, beef-tea, and milk-punch were repeatedly given in teaspoonful doses, but they did not reach the stomach. Resort was now had to enemata. Brandy, beef-extract, and milk-punch were thrown into the rectum every four hours. As a rule they were well retained, and seemed to afford some degree of relief. The patient now began to earnestly importune for an operation. Gastrotomy was the only recourse that offered a shadow of a hope. He, however, seemed in no more imminent danger at this period than at many times previously. It was remembered that at one time when death appeared inevitable, there was a temporary change for the better, and there was no reason why this having taken place once, it might not recur. In view of these considerations, and of the desperate nature of the operation, I did not feel justified in yielding to the earnest solicitations of the patient.

The man continued to sink, and his fast-failing strength was sustained by enemata alone. The pain he had previously suffered was less intense, and could be well controlled by morphia, but he had still to bear the horrors of unsatisfied hunger. Curiously enough there was at no time much complaint of thirst. Hunger caused the greatest intensity of suffering, and it was not absent for a moment.

After consultation with Professor Wallace, Drs. S. W. Gross, William Pepper, S. Weir Mitchell, and James H. Hutchinson, and with their concurrence, I decided to open the stomach. Accordingly, at 4 P. M., June 25th, in the presence and with the assistance of the gentlemen just mentioned, and Drs. J. H. Brinton, Townsend, and Hearn, and Mr. Johnston, Mr. Gemrig, and Mr. Newcomb, the operation was performed. On account of the low condition of the patient, and to avoid vomiting, it was thought highly important to dispense with an anæsthetic; but he insisted upon its administration, preferring to incur additional risk rather than suffer pain. Chloroform was therefore administered by Dr. Ralph M. Townsend. When the patient was fully under its influence, he was placed upon his back, the left side being somewhat elevated by means of folded blankets. A curvilinear incision, the convexity of which presented towards the median line, was commenced at the sternal extremity of the seventh intercostal space, and carried downwards and outwards for nearly four inches, exposing the sheath of the rectus muscle, which was slit up on a grooved director. The fibres of the rectus were next separated, partly with the fingers, partly with the scalpel, the cutting edge of the latter being used as little as possible, with the view of avoiding hemorrhage. The posterior lamella of the sheath of the rectus, the transversalis fascia, and the peritoneum were next successively divided on a director, when the stomach was seen projecting below the margin of the liver. It was firmly grasped by the forceps, and a curved needle armed with a silver wire, was passed through its anterior wall, in the direction of the vertical line of the body, the points of entry and exit of the needle being about an inch and a quarter apart. Two other needles, armed in the same manner, were then passed from left to right and made to cross the first at right angles; the wires, including that part of the stomach to be opened, which was at a point about two inches to the left of the pylorus. The first wire was then withdrawn, and by means of a pair of scissors, the stomach was opened in a perpendicular direction, and to the extent of an inch. The wires previously passed were thus exposed, and by dividing them the two sutures were converted into four.

Figs. 1, 2, and 3, for which I am indebted to Dr. Ralph M. Townsend, will convey a more correct idea of the manner in which the needles were

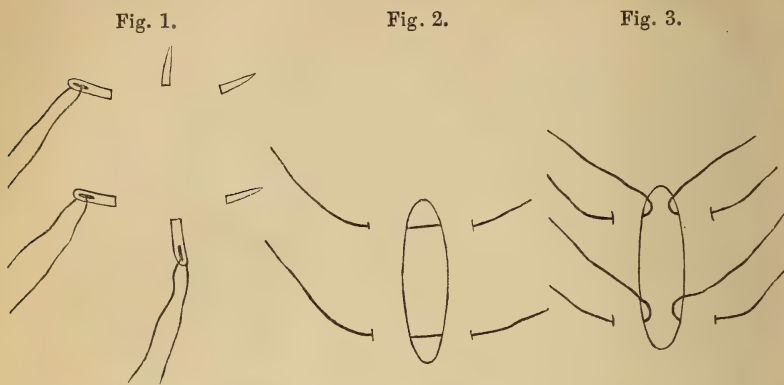


Fig. 1 represents the manner in which the needles were passed through the anterior wall of the stomach.

Fig. 2 represents the first suture withdrawn and the stomach laid open.

Fig. 3 shows the wires divided and ready to be attached to the abdominal walls.

passed and the sutures made, than the most detailed description. This mode of securing the stomach was the suggestion of Dr. S. Weir Mitchell, and I find it is essentially the same as that employed in several of the recorded operations of gastrotomy.

After the stomach was opened, constant traction was made upon it, in order that there might be no escape of fluid into the peritoneal cavity. The viscus was now attached to the edges of the opening in the abdominal walls, numerous silver sutures being employed for this purpose, thereby securing the most accurate approximation. A tube with a single flange, such as is employed when establishing gastric fistula in dogs, was inserted into the stomach, the flange resting upon the edges of the external wound, and confined in its position by means of tapes passed around the body. The wound through the abdominal parietes was then closed by ordinary sutures, and with this step the operation was concluded.

Immediately after the operation, a small quantity of beef extract was gently thrown into the stomach, and followed in fifteen minutes by a little brandy and water. The patient recovered from the influence of chloroform well, although evidently much prostrated, and, the moment his consciousness returned, he seemed to realize that death was near at hand. He was put to bed, wrapped in blankets, and bottles of hot water placed at his feet. Directions were given to inject a drachm of beef extract into the stomach every fifteen minutes, and to administer an enema of brandy every half hour. At six o'clock he began to sink. Respiration was 14; pulse 62, and extremely feeble. After 7 o'clock beef extract was injected into the stomach only once in forty-five minutes, but it was well retained, and the enemata of brandy were continued. After 8 o'clock he no longer recognized any one, but lay upon his back with half-closed eyes, not taking notice of anything. At 9 o'clock his respiration was 10 in the minute; pulse 30, and almost imperceptible; at 10 o'clock there was a profuse discharge of a dark grumous liquid from the stomach, which apparently being increased by the introduction of the beef extract, it was discontinued. The surface of the body was bedewed with a clammy perspiration;

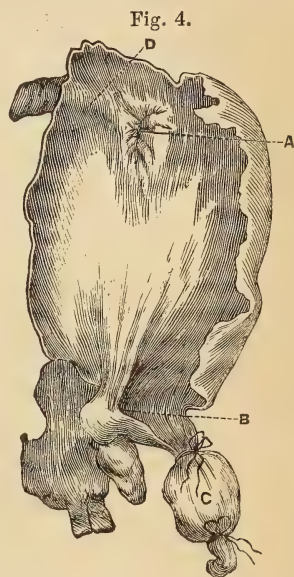
the extremities were cold, the eyes sunken, and the pupils did not respond to light. The pulse had risen to 90, the respiration had sunk to 8. At 2 A. M. respiration was 5 to the minute; pulse could not be detected at the wrist, although the heart was beating feebly 45 times in the minute, which sank to 28 at 2.30 A. M. From ten to fifteen minutes after the administration of brandy by the stomach and rectum, the pulsations of the heart were slightly increased in frequency, though not in force. This acceleration, however, was only transitory. At 5.30 A. M. the respiration was 3 and the heart pulsations 12 to the minute. Dissolution was evidently near at hand, and in half an hour he expired.

Post-mortem nine hours after death.—Abdominal cavity alone opened; body extremely emaciated; no fat in the meshes of the omentum, nor in the areolar tissue of the abdomen; small intestines greatly contracted and empty; peritoneum perfectly smooth, and uninjected, presenting no signs of inflammation; liver, spleen, kidneys, and all the internal viscera normal; no enlargement of any of the lymphatic glands. The stomach, part of the œsophagus, duodenum, and that portion of the abdominal parietes through which the incisions were made, were removed. There was a dense, firm stricture of the œsophagus just within its cardiac orifice, which produced such complete obliteration of its calibre as scarcely to admit of the passage of a probe. No evidence of ulceration; stomach contracted, and empty; its mucous lining of a healthy tint. The opening made was about two inches from the pyloric valve.

A critical examination showed that there had been accurate approximation of the stomach to the abdominal parietes, and no evidence could be detected of any tension or strain having been put upon the sutures. A microscopical examination of the substance of the stricture kindly made by Dr. Pepper and Dr. Tyson, gave no evidence as to its nature, except that it probably was not cancerous.

Fig. 4, from a drawing by Dr. Townsend, represents the stomach laid open along its posterior wall, and a portion of the abdominal walls with two of the costal cartilages. A. Cardiac orifice. B. Artificial opening. C. Duodenum.

Remarks.—That gastrotomy under certain circumstances is proper there can be no doubt, but it was with the greatest reluctance that the importunities of the patient and his friends were yielded to, and the responsibility imposed was one which I would gladly have escaped. I now regret, however, that I did not propose the operation as soon as the patient became unable to take solid food, and before the vital powers were undermined by prolonged starvation. So great is my conviction that the procedure is justifiable, and to be regarded as one of the established operations of surgery, that I would have no hesitation in resorting to it



in any case of impending starvation from non-cancerous stricture of the œsophagus, provided inanition had not reached a stage which rendered the case hopeless, and I may state that Drs. S. W. Gross, William Pepper and S. Weir Mitchell entertain similar views.

This is the first operation of gastrotomy for obstruction of the œsophagus performed in this country, and is the tenth on record. Dr. Fenger, of Copenhagen, reports one case in the *Archiv. für Path. Anat. und Physiol.* 1854, vol. vi. p. 350; Mr. Sydney Jones two cases, the first recorded in the *Transactions of the Pathological Society*, vol. xi. p. 101; the second in the *Lancet* of Dec. 16th, 1866; Mr. Arthur E. Durham one case reported in the *Guy's Hospital Reports* for 1868; M. Sédillot, of Strasbourg, has operated in two cases, the first reported in his *Traité de Médecine Opératoire*, tom. II., p. 272, the second in the *Gazette des Hôpitaux*, 1853; Mr. Forster records two cases, the results of which may be found in the third series, vols. iv. v. of *Guy's Hospital Reports*, and Mr. Curling one case published in the *London Hospital Reports*, vol. iii. p. 218.

As to the manner of operating, there seems to be no essential difference. M. Sédillot preferred the method followed by myself, that is, through the rectus muscle. Mr. Durham seems to regard it as important that the external incision should be over the left linea semilunaris, and that the stomach should be entered near the greater curvature; but I deemed it proper to make the opening near the pylorus, since at that point there is the least motion of the organ, and, consequently, its connection with the abdominal parietes would be less likely to be disturbed. In Mr. Cooper Forster's first case he made his incision "over the course of the left linea semilunaris," and in his second case he "made an incision about two inches in length along the outer edge of the rectus muscle in the left hypochondriac region, commencing at the cartilages and opposite the space between the seventh and eighth ribs." Mr. Sydney Jones began his incision "at the inner border of the ninth rib, and carried it vertically downward." But the termination of all the cases having been the same, no advantage can well be claimed for any particular line of incision. Mr. Jones' result was probably the best, his patient surviving twelve days, when he died of pneumonia.

The case now recorded being one of syphilitic and not of cancerous origin, if operated upon earlier would have been a fair test of the value of gastrotomy, with a view, not only to the prolongation of life, but to an ultimate cure. Could life have been maintained through the agency of a gastric fistule, opportunity would have been afforded for the more effectual treatment of the stricture, and it is not impossible that the functions of the œsophagus might have been permanently re-established.

The time during which life was sustained by means of nutritious enemata in this case, is a point of great interest and practical value. The mother,

in whose statements I repose the utmost confidence, asserts that, for six weeks previous to his death, not a drachm of any fluid whatever entered his stomach, and for six months antecedent to the operation he certainly partook of no solid food. It must also be borne in mind that, under the most favourable conditions, the amount of nutriment finding its way into the stomach was exceedingly small, and of itself utterly inadequate to the wants of the system. In reality, therefore, the economy drew almost its exclusive supply from the rectum, for a period of much longer duration than six weeks. Indeed, there seemed to be a certain law of compensation, and an accommodation to the exigencies of the occasion, the absorptive power of this man's rectum being certainly greater than is generally thought to belong to that portion of the alimentary canal. The case mentioned by Dr. Barlow, where life was sustained by enemata alone for seventy days, would seem to confirm this view. The rectum being supposed incapable of rendering aliments fit for absorption, Dr. Gull has proposed that the food, previous to injection, be mixed with pepsin. I am not aware, however, that any experiments have been made with the view of testing the value of this suggestion.

It will have been remarked that food was introduced into the stomach shortly after its having been opened. The propriety of such a step is questioned by Mr. Durham, and objections can certainly be urged against it. But it was manifestly proper in this case, as the man was already on the brink of the grave, and death was imminent from the want of nutriment. It was not an experiment that could be performed with any degree of propriety in this instance, as the only chance remaining was that the food brought in contact with the gastric mucous membrane would be quickly absorbed, and bring fresh life to waning vitality. When death from inanition is not threatened, it might be well to nourish the patient for a few days by the rectum, until the stomach accommodates itself to its novel relations, but assuredly no such course should be pursued in cases similar to that now recorded.

In conclusion, I must express my indebtedness to Mr. Hermann W. Newcomb for the above accurately drawn up history of my case.

ART. VIII.—*Cases of Ovariectomy.* By WASHINGTON L. ATLEE, M. D., of Philadelphia, Fellow of the College of Physicians of Philadelphia, etc. Reported by J. EWING MEARS, M. D., Member of the Pathological Society of Philadelphia, etc.

CASE 205. *Multilocular ovarian tumour; tapped once; inveterate adhesions; operation, June 8, 1869, by Drs. Getchell and Atlee; incision four inches long; recovery.*—Mrs. G. R., æt. 35, married, resident of this city,

was visited by Dr. Atlee in consultation with Dr. Helfrich, Jan. 5, 1869. She gave the following history of her case: About six months ago, while returning from market, she was struck in the abdomen by a market basket, which was followed by a pain in her left side, low down; no increase in size occurred consequent upon this accident.

December 27, 1868. She was seized with a very severe pain in the left side, which continued to increase until it became so intolerable that Dr. Helfrich was sent for. In the belief that the pain depended on the passage of a renal calculus, an anodyne was prescribed, and rest enjoined; at this time there was also a protrusion of the umbilicus; since this attack she has remained in bed, and enlargement of the abdomen has rapidly taken place; although disposed to corpulency, she is now somewhat reduced in flesh.

Menstruation commenced at the age of fourteen, occurring up to the present time every two weeks, and always profuse. At the age of twenty-five she was married, and has borne one child, now seven years old. Labour was natural, and menstruation returned fourteen months after child-birth.

Examination shows the abdomen enlarged to the size of pregnancy at full period, quite elastic at some points, and harder at others; fluctuation is inferred on palpation, but on percussion it is scarcely perceptible; resonance is distinct along the right side and in the upper portion of the abdomen. Uterus central and movable, os patulous, and the sound enters three and one-half inches; pelvis free.

General health of the patient good; bowels regular; urination frequent; states that she has always enjoyed good health, and is free from any hereditary predispositions.

Diagnosis.—Multilocular ovarian tumour of an acute character.

February 8, 1869. Dr. Atlee tapped the patient, and removed six quarts of blood-red fluid, which coagulated firmly when subjected to heat; after the removal of the fluid a large semi-solid mass occupied the left side filling up that region of the abdominal cavity. Examination a few days later discovered the tumour occupying a central position indicating absence of adhesions.

March 23. The puncture made in tapping, after having been firmly healed, ulcerated, and permitted the copious discharge of an offensive fluid, purulent in character.

June 1. Dr. Helfrich, having gone to Europe, left his patient in the charge of Dr. Getchell, whom Dr. Atlee met in consultation on this date. The discharge mentioned above has continued, producing extreme exhaustion and emaciation; the abdomen is still uniform in shape, and every where resonant on percussion as if the cyst contained air. Condition of the patient at this time placed her case in the class designated in the first report as the second, and the propriety of operative interference, with a view to avert impending death, was fully discussed by Drs. Getchell and Atlee.

The patient desiring to avail herself of the only chance of life remaining, signified her willingness to submit to an operation.

8th. Ovariectomy was performed, Drs. Getchell, Atlee, Burpee, Hunt, and Mr. McClellan, medical student, being present. Dr. Getchell commenced the operation by making an incision about four inches in length, and to the left of the ulcerated opening.

The structures divided by the incision were so changed by inflammation,

thickened and indurated, that the cyst wall, which was intimately adherent to the abdominal wall, could not be readily recognized; when satisfied that the cyst had been reached, the fingers were introduced, and the adhesions immediately surrounding the incision were, with much force, broken up. At this stage of the operation Dr. Atlee, at the request of Dr. Getchell, introduced his hand into the abdominal cavity and separated the remaining parietal adhesions, which were extremely firm and required great force, and the tumour was turned out of the abdominal cavity. The transverse and descending portions of the colon were adherent to the tumour; both were detached by dissecting off the peritoneal coat of the tumour, and leaving it attached to the intestine.

The pedicle was secured by the clamp and divided. One vessel in the meso-colon required ligation, the end of the ligature being brought out through the incision; very little hemorrhage occurred; the incision was closed by five wire sutures.

The tumour consisted of the left ovary, multilocular in character. Its interior was very rough, and contained a quantity of most offensive purulent matter.

The patient recovered without an unpleasant symptom, and in September following reported herself restored to perfect health.

CASE 206. Monocystic ovarian tumour; strong adhesions; never tapped; operation, July 1, 1869; incision four inches in length; recovery.—Mrs. A. H., æt. 45, resident of Chester, Delaware County, Pennsylvania, consulted Dr. Atlee June 7, 1869, and gave the following history of her case: Menstruation began at the age of twelve years, and, although profuse and painful, has always been regular until after the birth of her last child now four years old; she married at the age of twenty-seven years, and has borne seven children; her labours were easy and recoveries good.

September 14, 1867. She was seized with severe pains in the hips and back, which resembled labour pains so closely that Dr. W. W. Johnson of Chester, who was called, thought that a miscarriage was about to occur; about this time she noticed an enlargement in the centre of the abdomen; menstruation continued at irregular intervals, and the abdomen gradually increased in size so that she believed herself pregnant, and thought she felt the motions of a child. Return of the menses after an interval of thirteen weeks, dissipated the belief that she was pregnant; general health has been good until lately, when she has emaciated quite rapidly.

On examination the abdomen is found larger than at the full period of pregnancy, prominent and slightly irregular in shape; fluctuation distinct and accompanied by a very peculiar trembling over the right umbilical region; os tincæ close behind the symphysis pubis; the sound enters two and one-half inches, causing pain, but the uterus is fixed and immovable; deposits can be felt in the pelvis, confined mostly to the superior strait. Contents of the pelvic cavity fixed and immovable; most of the distinctive features of a multilocular ovarian cyst are present, but not sufficiently well-marked to render the diagnosis positive; after careful examination it was decided to be a monocystic ovarian tumour.

July 1, 1869. Ovariectomy was performed at Chester, Drs. Burpee and Emanuel of Philadelphia, and Drs. Johnson and Harvey of Chester, being present. Anæsthesia being produced by the mixture of chloroform and ether, an incision two inches in length was made in the linea alba down to

the cyst; on the introduction of the fingers, firm parietal adhesions were found to exist; these were separated as far as possible by the fingers, and the cyst was evacuated, removing about two and one-half gallons of purulent-like fluid. In order to separate the adhesions which existed between the cyst and other portions of the parietes of the abdomen, and also those which were found in the pelvic cavity, it was necessary to enlarge the incision two inches. The adhesions being broken up the tumour was removed, and the pedicle which involved the right broad ligament of the uterus, and was thin and fragile, was secured by the clamp and divided; considerable hemorrhage occurred from separation of the adhesions; one small artery in the right lumbar region required application of the acupuncture needle; the blood which had collected in the pelvic cavity was removed by soft sponges, the other ovary examined and found healthy, and the incision was closed by four iron wire sutures.

The tumour consisted of the right ovary, and was monocystic, with some slight deposits in its walls. The cyst wall was very thick, and had evidently undergone inflammatory action.

The patient reacted well from the operation; no nausea or vomiting occurred, and recovery speedily took place.

CASE 207. *Multilocular ovarian tumour; tapped once; adhesions; operation, July 3, 1869; incision four and one-half inches in length; recovery.*—May 17, 1869, M. W., æt. 50, unmarried, small, and delicate, resident of this city, consulted Dr. Atlee for an enlargement of the abdomen. She states that about two years ago she noticed an enlargement in the upper portion of the abdomen, and down the right side. At first the swelling would disappear and again return, but for the past year the increase has been permanent and progressive; two months since œdema of the lower extremities occurred and has persisted; orthopnoea has existed for some time past; menstruation began at the age of seventeen, at first irregular, profuse, and painful. Under active treatment she became regular, and so continued until the age of forty-seven, when it suddenly ceased. Subsequently she had, at irregular intervals, slight bloody discharges, and for the past two weeks a constant reddish-yellow discharge.

Abdomen larger than at the full period of pregnancy, and very tense; its lower border œdematous, and the skin inflamed; fluctuation distinct; dulness over the entire surface on percussion; the uterus *in situ*; walls of the pelvic cavity œdematous. Paracentesis abdominis was performed, removing thirty pints of transparent gelatinous fluid, the consistence of mucilage, which coagulated only to a limited extent by heat. The enlargement in the right side and anterior portion of the abdomen subsided on tapping, the left side remaining elevated, particularly the left hypochondrium, which was occupied by a tumour resembling the hypertrophied spleen, its position corresponding to that of the spleen.

May 21. (Edema has disappeared from the extremities; abdomen more uniform in shape, tumour in the region of the spleen having gravitated towards the centre; resonance now exists in the left hypochondrium and in the epigastrium; firm masses can be felt along the left side, above the pubes, and also in the right iliac region; pelvis free; uterus central, small, and movable, not penetrable by the sound. Diagnosis, multilocular tumour, involving left ovary.

July 3. The fluid having rapidly re-accumulated, accompanied by the same conditions of orthopnoea and œdema of the extremities, ovariectomy

was performed, the following physicians being present: Drs. Cady, attending physician, Burpee, Mears, Keen, Hoffman, Schell, Stryker, of Philadelphia, Bockius, of Germantown, Bartholomew, of Worcester, Mass., and Rowell, of Florence, Alabama. The usual anæsthetic was administered, and an incision three inches in length made in the linea alba; the cellular tissue was very œdematous. The adhesions which existed between the tumour and the anterior wall of the abdomen were separated with slight force. In accomplishing this, the large cyst was ruptured, and the contents, similar to the fluid removed at the tapping, and measuring several gallons, escaped through the opening. In order to reduce the size of the multilocular mass filling up the left side, the wall of the cyst was incised, the hand introduced, and the septa broken down, evacuating the fluid into the large cyst; from this cyst it was removed without getting into the peritoneal cavity. The incision was then enlarged to the extent of an inch and a half, and the tumour by gentle traction and pressure was extracted through the comparatively small opening; the pedicle, short, small, and vascular, was secured by the clamp, and severed. Very little hemorrhage occurred; a small parietal vessel in the iliac region was acupressed, the parts carefully cleansed, and the incision closed by four wire sutures. Time occupied in the operation, thirty minutes.

The tumour consisted of the left ovary, contained thirty pints of fluid, and weighed fifty pounds; the other ovary was healthy. No nausea or vomiting occurred, and patient made a rapid recovery.

CASE 208. Double ovariectomy; multilocular ovarian tumours; inveterate adhesions; never tapped; malignant; operation July 21, 1869; incision four and one-half inches in length; death in forty-eight hours.—June 25, 1869, Dr. Atlee examined Mrs. G. H., of Baltimore, Md., in consultation with Drs. John Morris and Domè, of that city. She is a native of Germany, æt. 55 years; married at twenty-seven years of age; has borne four children, the youngest eighteen years old; children large, and labours difficult; two were stillborn.

She first noticed a tumour in the right side in November, 1868, and before that time had experienced some difficulty in micturition. Emaciation has rapidly occurred, and she is now cachectic and broken down.

Abdomen as large as a woman at full period of pregnancy, and its shape irregular. Cysts can be felt in both sides, with a firm resisting mass between them, the latter occupying a position below the umbilicus and to the right of the linea alba; pelvis occupied by a resisting mass; uterus greatly elevated; os can scarcely be reached; it is above and to the right of the symphysis pubis; the sound enters three and one-half inches, and is strongly resisted by hard tissue; uterus hypertrophied; presents itself as the hard tumour occupying the position below the umbilicus, and to the right of the linea alba; uterine hemorrhage has never occurred; diagnosis, multilocular ovarian tumours, with fibroid degeneration of the uterus, and pelvic and abdominal adhesions.

Prognosis, very unfavorable. July 9, Dr. Morris wrote Dr. Atlee to the effect that the patient was very desirous of submitting to operative interference, and "was determined to undergo all the perils of an operation."

July 21. Dr. Atlee visited Baltimore at the request of the patient for the purpose of performing ovariectomy. She was still declining in health. The operation was performed, the following physicians being present:

Drs. Morris, Domè, attending physician, Mitchell, Allen Smith, Doyle, and Garretson. The anæsthetic having been administered, an incision about three inches in length was made in the linea alba down to the cyst, giving exit to a small quantity of peritoneal fluid. The uterus, owing to its increased size and elevation, was brought into view at the lower part of the wound. The incision was extended in both directions, so as to measure four and one-half inches, and the presenting cyst was tapped. Several smaller cysts in the right and left sides were evacuated through the opening made in the presenting cyst, removing several quarts of fluid of different colour and consistence, and the size of the tumour was much reduced. At this stage of the operation, muscular spasms occurred, contracting the abdominal muscles so firmly as to cause extrusion of the small intestines and transverse colon. These were carefully guarded from injury, and on the completion of the operation, gently returned to the abdominal cavity.

The enlargement of the incision, and evacuation of the cysts, permitted an inspection of the cavity, and an examination of the condition of its contents. The uterus was enlarged by deposits to the size of a double fist; the broad ligaments on both sides were thickened and expanded over cystic masses, and firmly adherent to them; the lower portion of the abdominal, and also the pelvic cavity were filled by an aggregation of small thin-walled cysts which were bound down by firm adhesions to the surrounding parts; the cysts in the upper portion were larger, and not so firmly adherent, but their walls were extremely fragile, and ruptured in the efforts made to detach them. An effort was made to dislodge the tumour of the left ovary by enucleation, but this method failed owing to the firm character of the adhesions and the fragility of the cyst-walls. The smaller cysts were then ruptured, and as much of the tumour as could be separated was removed in a ragged mass, attached to the pedicle, which involved the left broad ligament; the clamp was applied and the pedicle divided.

The tumour of the right ovary, also a multilocular mass, and firmly adherent, with fragile walls, was removed in the same way, and the pedicle, short and thick, was secured by the clamp and severed.

The pelvic cavity was still filled up with small cysts and masses of shreds and morbid tissue; the cysts were ruptured, and as all nutrition was cut off, it was hoped that if the patient survived, they, with the surrounding adventitious tissue, would be removed by absorption or suppuration.

The large size of the uterus, with the short pedicles, with the clamps attached, rendered it impossible to replace that organ in the cavity of the abdomen, and approximate the edges of the incision. Ligatures, with one end placed between the edges of the incision, were, therefore, substituted for the clamps. An attempt was now made to return the extruded intestines, and was successful only after prolonged effort, owing to the rigid condition of the muscles of the abdomen.

The incision was closed by six wire sutures and two pins, and a tent introduced at the lower angle to permit free drainage.

An examination of the intestines before they were returned to the abdominal cavity, showed them to be greatly congested, the mesentery very vascular, and filled with tubercular-like deposits; the omentum was thickened and contracted into a roll, and the whole interior of the abdomen was in a morbid condition, and the peritoneum studded with tubercular-like

masses. The general impression was that the tumour was malignant in character.

The anæsthetic was well borne, and no nausea or vomiting occurred; the pulse flagged at times, but soon responded to stimulants; several ounces of venous blood were lost, but there was no active hemorrhage, and no vessels required ligation.

The patient reacted from the operation, but soon began to sink, and died in forty-eight hours. No post-mortem examination of the body, and no microscopic investigation of the tumours were made.

Remarks.—It is greatly to be regretted that an autopsy was not made in this case, and that the microscopic characters of the tumours were not determined.

The symmetrical nature of the disease, associated with manifestations of morbid conditions in the surrounding structures, as well as the gross appearance of the tumours, seems to confirm the opinion expressed at the time of the operation in regard to the malignancy of the disease. In very many particulars the conditions found to exist in this case correspond very closely with those described as occurring in the alveolar variety of carcinoma, which form of disease it is stated rarely occurs anywhere but in the ovary. It exists as “an accumulation of numerous fibrous sacs, which diminish in size from the circumference towards the interior, and especially towards the base of the morbid growth, the latter representing a condensed alveolar mass, the alveoli of which consist of a white, shining, fibrous tissue, and contain a colorless or grayish, yellowish, yellowish-green, or reddish viscid gelatine;” the peripheral follicles are converted into larger sacs and establish the ovarian dropsy. It is also stated that the malignant character of this species of ovarian dropsy is established by the existence of a well-marked cachexia, and by “the complication with cancer (especially of the medullary variety) in the same organ, and with other varieties of cancer in other organs, as the peritoneum or the stomach.” It is with especial reference to this fact, that the absence of any post-mortem examination and microscopic study is regretted, by means of which the nature of the tubercular-like masses which occupied the mesentery and studded the peritoneal surfaces, as well as the deposits which produced the hypertrophy of the uterus, could be definitively determined.

In reference to the propriety of operative interference in this case, it is to be observed that it clearly belongs to the second class of cases, in which the operation is undertaken with the forlorn hope of diminishing suffering, of arresting impending danger, of prolonging life, and, as sometimes occurs, of restoring to perfect health.

CASE 209. Multilocular ovarian tumour; extensive and inveterate adhesions; tapped eight times; operation September 29, 1869; incision three inches; no pedicle; death on the fourth day.—Mrs. P. H. G., æt. 35, resident of San Francisco, Cal., was examined by Dr. Atlee

at Brooklyn, N. Y., September 28, 1869. She had arrived a few days before by rail, having come east for the purpose of submitting to a surgical operation for the relief of an abdominal tumour, with which she had been afflicted for thirteen months. Menstruation began at fifteen years, and has always been regular. She was married at twenty-two years of age, and has borne six children, the last one year ago.

About three months before the birth of the last child, she noticed that her abdomen was becoming unusually large, and she gradually increased in size to such an extent that her physician thought her pregnant with twins, and combined with this a large accumulation of liquor amnii; the foetal movements were only perceptible on the right side. She arrived at the full period of gestation, and was delivered, in an easy labour, of a living child. There appearing to be no diminution in her size after the birth of the child, she was tapped, and two bucketfuls of fluid of a bloody colour were removed. From August, 1868, to September, 1869, she was tapped eight times, removing varying quantities of fluid, which differed in colour and consistence. Up to the sixth tapping the abdominal enlargement entirely subsided. After the sixth, seventh, and eighth tapplings, a tumour remained in the upper portion of the abdomen, being larger after each tapping. At one of the tapplings the fluid is mentioned as purulent, and after the second tapping menstruation did not reappear. Patient extremely emaciated and cachectic, with a small, thready, almost imperceptible pulse; she has a strong resolute will, and insists on submitting to an operation.

Examination shows the abdomen irregular in shape; the outlines of several cysts can be distinguished by the eye. In the upper portion, several small cysts are traceable, whilst the lower portion is occupied by a large one, in which fluctuation is quite distinct. Uterus central; admits the sound two and one-half inches, and is more or less fixed in position. The fact stated by the patient, that when tapped, the lower part of the abdomen subsided, and the upper portion projected, and remained in that condition, clearly indicated that adhesions existed.

Diagnosis, multilocular ovarian tumour; prognosis, very unfavourable.

September 29, 1869. Ovariectomy was performed, Drs. G. Cochran, attending physician, Kissam, A. Cochran, Bauer, Tucker, Gilfillan, and Walker, all of Brooklyn, being present. The anæsthetic having been administered, an incision about three inches in length, was made in the linea alba, and almost immediately divided the cyst-wall, which was very thin and intimately incorporated with the parietes of the abdomen, so that the section seemed to be through one kind of tissue, there being no lines of demarcation. On opening the cyst about two gallons and a half of milky-coloured fluid, resembling somewhat in colour and consistence soft soapsuds, was evacuated. An attempt was made to separate the cyst from the abdominal wall, but, owing to firm adhesions and fragility of the cyst-walls this was only partially accomplished. Further explorations disclosed extensive and strong adhesions between the tumour and all the surrounding structures, and any efforts made to break them up resulted only in detaching masses of softened tissue. The secondary cysts were ruptured, and the interior of the cyst, as it were, eviscerated, removing also as much of the adherent cyst-wall as possible. The intestinal adhesions were not disturbed, and no attempt was made to dislodge the portion of the tumour imbedded in the pelvic cavity, and inextricably incorporated with the contained organs and adjacent parts, as it were, matted together in one mass by bands of adhesions, and inflammatory exudations; the cysts were rup-

tured as in the upper portion, and the contents removed, leaving the cyst-wall adherent, and with it the pedicle. The cavity was now cleansed, and the incision closed by five wire sutures, a tent being introduced at the lower angle. Considerable venous oozing occurred from the lacerated adhesions, which was controlled by pressure; no vessels required ligation.

At times the patient was exceedingly weak, but bore the operation quite well, and was placed in bed with a pulse quite as good as when the operation was commenced. The attending physician, Dr. George Cochran, reported that she never rallied, and died on the fourth day from exhaustion.

Remarks.—This case also belongs to the second class. Dr. Atlee had been solicited to visit San Francisco for the purpose of operating at her own home. Failing to receive any encouraging reply, she started, in spite of her enfeebled condition, to make the long journey by rail, and went to her brother's house in Brooklyn, N. Y., determined to submit to an operation. When the unfavourable prognosis was announced to her, and the opinion stated that an operation afforded the only chance of life, and that a remote one, she expressed her entire willingness to submit, and announced herself grateful at the determination on the part of Dr. Atlee to perform the operation. He believes that an operation at home—before the mental and physical strain, incident to a long, uninterrupted and exhausting journey had, with her disease, so prostrated the vital powers—would have offered much greater prospects of success.

ART. IX.—*Encephaloid Disease of the Right Humerus; Amputation at the Shoulder-Joint; Recovery.* By WM. A. GOTT, M. D., of Veroqua, Vernon County, Wisconsin, late Surgeon 25th Regiment, Wisconsin Infantry.

WM. H., æt. 55, farmer, of irregular habits, came under my care in the early part of April, 1868, on account of severe and constant pain in the arm, commencing in its middle third and extending down along the outer aspect of the forearm to the hand and fingers. He attributed the pain to exposure to cold and wet for a number of days in a cranberry marsh in the fall of 1867, and supposed it to be of rheumatic origin. He has been subjected without benefit to a great variety of medical treatment at the hands of irregular practitioners, all of whom corroborated his own opinion respecting the nature of the disease. The pain is described as deep-seated; lancinating at times, very persistent, and so severe, especially at night, as to deprive him of his rest and cause him extreme suffering.

There was no discoloration of the affected part, or tumefaction of the integuments or of the soft tissues beneath, nor was pain complained of on making firm pressure; it was thought, however, that a slight enlargement of the bone at its middle third could be felt, especially on comparison with the sound limb, but the difference was not so manifest as to relieve the mind of doubt. The man's general health is good. Were it not for the

excruciating pain, he says, he "would feel as well as ever." What is the cause of this "terrible pain, so unlike any other?" What is the nature of the disease? were the questions to be solved. In fact, my suspicions were that malignant disease had invaded the bone tissue, which would sooner or later present a formidable array of symptoms: these suspicions were frankly stated to the patient, as well as to his immediate relatives. The treatment adopted consisted of iodide of potassium, in doses of five grains three times a day, and the repeated application of a blister to the affected part, which was followed, for several weeks, with the exception that the tincture of iodine was substituted for the blisters, the patient insisting that their use aggravated the pain and gave rise to additional suffering. In view of this fact, and convinced of the danger of delay in such a case, I advised the patient to submit to amputation at the shoulder-joint as his only resort. To this his consent could not be obtained; and consequently he passed from under my observation for the time.

The progress of the disease up to this time has been quite uniform; the pain is as severe and persistent, and the bone shows an increased bulging of its walls more evident to touch than to sight, and gives on firm pressure the feeling of semi-elasticity.

February 19, 1869. I was called again to the patient, and found him at the table enjoying a good dinner. He bluntly informed me that since I last saw him he had again been under the treatment of "two quacks," to use his own expression, one of whom pronounced his disease "*muscular polypus*," and confidently assured him a certain cure in case his directions were strictly complied with, and that he had now become convinced that amputation of his arm afforded him the only chance of his life. There is at present a tumour involving the entire circumference of the bone, measuring fifteen inches at the greatest circumference, and eight inches in its long diameter; and extending upward within three inches of the joint, and downward as far as the inferior line of the middle third of the bone. Within the last month or two its growth has been more rapid than at any previous time. It is lobulated, has a semi-elastic feel, and the subcutaneous veins are much enlarged; its surface is slightly discoloured, and what is unusual, it shows no tendency to ulceration at any point. At one or two points on its anterior aspect an indistinct fluctuation is felt, which, to the inexperienced finger, might be taken as an indication of the presence of matter, and lead to its evacuation.

23d. Amputation at the shoulder-joint was performed to-day, with the assistance of Drs. H. A. Chase and A. W. Tinker, both of this place. An examination of the tumour just prior to the operation revealed a very rapid growth within five days, its greatest circumference measuring sixteen and three-quarter inches, an increase of an inch and three-quarters; and its long diameter nine inches, an increase of an inch. A perceptible change had also taken place in the patient's general health, which had become broken down under his long-continued suffering.

The patient having been brought fully under the influence of an anæsthetic, equal parts of ether and chloroform, and the subclavian artery compressed by Dr. Chase, a long double-edged knife was passed through from the inner edge of the deltoid under the acromion, grazing the surface of the humerus, and an external and superior flap of sufficient extent was formed. This was raised, and the tendinous attachments of the muscles were divided, the head of the bone dislocated outwards, and the knife passed behind it, cutting out the inferior internal flap. As this flap was

being formed, a copious hemorrhage took place from the subscapular, circumflex and profunda arteries, enlarged to twice their normal size, which was speedily arrested by an assistant grasping the flap until the ligatures could be applied. The tissues adjacent to the bone were very vascular, condensed, and indurated, to an extent unlooked for by those present; the under surface of the deltoid so much so as to necessitate the removal of most of its substance by the scalpel. Several large masses of similar tissue were likewise removed from the axilla; in effecting this, the axillary artery was redivided, its stump being imbedded in the mass. The flaps were adjusted and held by interrupted sutures, supported by adhesive strips. As soon as the patient had returned to consciousness, a half of a grain of morphia was given, under the influence of which reaction became pretty well established after the lapse of an hour.

The specimen presented the usual morbid appearances met with in this disease, and so accurately delineated in surgical works. The walls of the shaft above the tumour, as well as the head, were much attenuated, flexible, and somewhat elastic; the cartilage of the head discoloured and softened, so as to be readily separated; the internal structure was for the most part soft, broken down in places, dark-coloured, and mixed with a bloody fluid. In that part of the shaft below the tumour, the morbid appearances were not so manifest: the investing periosteum of both portions was much thickened, and its bloodvessels enlarged; the tumour, invested by the thickened periosteum, contained a brain-like substance, mixed with spicula of bone here and there, the cancellated structure, of course, being completely destroyed.

24th, 10 o'clock A. M. Has passed a comfortable night; to use his own language, it was "the first night's rest I had in over a year." Complains of pain in the hand and fingers of amputated limb at times: there is slight febrile reaction. Ordered a dose of sulphate of morphia at night and a nourishing diet.

27th. Wound now dressed for the first time. It looks well, union by the first intention having taken place at its extremities; several of the sutures were removed, leaving the central ones untouched; the flaps were freely painted with tincture of iodine, as well as the parts in the vicinity, and directions were given for its daily application if it was found that it could be borne. Prescribed the following: R.—Potass. iodid. $\mathfrak{z}\text{ij}$, ext. conii. $\mathfrak{z}\text{iss}$, tinct. opii $\mathfrak{z}\text{j}$, ext. sarsaparillæ fl. $\mathfrak{z}\text{iv}$.—M. A teaspoonful three times a day.

March 1. Improving. Complains of throbbing pain in the axilla, which prevented him from resting last night. On removing the dressings there is observed to be a hard, tender spot, about two inches below the line of the incision. Directed the discontinuance of the iodine to the lower flap and a flaxseed-meal poultice in its stead. The central portion of the wound is rapidly healing by granulation. Continued previous treatment.

6th. Since the formation and discharge of the large collection of matter in the axilla (half a pint according to the patient's estimate coming away spontaneously a day or two since), everything seems to be going on well. Under the daily use of the iodine the tissues are resuming their natural softness and pliability. The patient's general health is still improving. Treatment to be continued.

12th. A manifest improvement both in the patient's general condition and that of the shoulder has taken place since the last report. The flaps

have nearly recovered their healthy state, and the healing process in the wound is nearly completed. To continue treatment.

26th. The parts about the shoulder have apparently healed up sound and well, and there is nothing in the general condition of the patient to indicate a return of the disease, either in the flaps and vicinity, or in any of his internal organs; he was, consequently, dismissed from my immediate care, and advised to continue the local application as well as the constitutional treatment for a short period.

Remarks.—Considering the admitted severity of this operation, the age of the patient, his former habits, the malignancy of his disease, and its extensive invasion of tissues beyond the bone, the preceding result was hardly to be expected; especially, since the disease is apt to return in the cicatrix, lymphatic ganglia, or internal organs. Were a similar case to present itself to me, instead of depending upon the muscles for the bulk of my flaps, I should be induced to perform the operation by flaps of the integument only, and a circular division of the muscles close to the joint; for by so doing, the greater part of the unhealthy tissue in the vicinity of the disease itself, would be removed much more speedily and effectually than by any other method.

The after-treatment of the flaps by the application of the tincture of iodine had a very happy effect upon the unhealthy tissues in hastening their return to a normal state. At present writing (Oct. 30), the patient continues in the enjoyment of good health, nor is there anything in the condition of the shoulder to indicate a return of the disease.

ART. X.—*Two Cases of Encephaloid Cancer.* By WALTER COLES, M. D., of Parkersburg, West Virginia.

THE two following cases of cancer will be found to possess features of more than ordinary interest; the first, exemplifying unprecedented immunity, after ablation; whilst the second most strikingly illustrates the potency and therapeutic value of nutritive enemata in sustaining the system.

CASE I.—Mrs. F., æt. 53, tall, slender, dark hair and eyes, sallow complexion, married, mother of two children, youngest aged twenty-seven. At the age of twenty-five, after having weaned her first child, she discovered a small, hard, painless tumour, about the size of a walnut, in the centre of the left breast. She could think of no injury likely to have produced it. For several months it increased slowly, with occasional sharp pain. After nine months she became pregnant with her second child. From this moment the tumour enlarged rapidly, and with considerable pain at more frequent intervals, of a sharp lancinating character, accompanied with a sense of wearisome heaviness in the organ. After three months of preg-

nancy, the breast was amputated by Prof. H. A. McGuire, of Winchester, Va., in October, 1839. The patient made a rapid recovery; was confined on the fourth of March, 1840, and nursed her infant for the usual time, from the right mamma.

The tumour removed, I now have in my possession; it is about the dimensions of a good-sized orange; is somewhat bi-lobed in shape, and surrounded with condensed cellular tissue. It is heavy, of a lardaceous feel, very firm under the knife, and to the naked eye presents the appearance of an infiltration, around the edges of which the glandular structure is visibly interspersed. How far these qualities may have been modified, or determined by long maceration in alcohol, it is difficult to determine. Suffice it to say, however, that a careful investigation of all the facts in this case seems to warrant no very great doubt of its malignancy, but indicates an example of one of those "*acute*," "*elastic*" tumours of Paget, which stand midway between true scirrhous and medullary cancer.

After being operated on, Mrs. F. enjoyed vigorous health until the spring of 1867, when her catamenia (which had disappeared since 1861) returned, and its almost uninterrupted flow debilitated her considerably. In the following September I was consulted, and on vaginal examination, discovered a firm, elastic tumour, about the size of a turkey's egg, occupying the whole anterior surface of the vagina for two and a half or three inches from its mouth. The urethra passed directly through the centre of this growth, which was smooth on its surface, but lobulated, and gave off a branch which swept around on the left side of the pelvis to the rectum, the anterior surface of which was at this time alone involved, and to the finger in the vagina, felt like hardened scybala. The main body of the tumour was easily exposed by parting the vagina with the fingers; it presented a bluish, livid aspect, and was overspread with tortuous veins. The bloody discharge seemed to be of a passive character, and emanated from the vaginal walls, the uterus being apparently healthy. There was no trouble either in retaining or discharging urine. The bowels were moved with difficulty. At this time the patient complained of no pain whatever.

Perceiving the hopeless condition of things, a tonic, with generous diet, was prescribed. Thus matters stood for two months, when the tumour was found to be steadily enlarging, and urination was so difficult that the patient was provided with a catheter, which she learned to use with ease. Thus, for six months, a season of comparative comfort was passed; there was steady emaciation, although the appetite continued good. The vagina was now well nigh blocked up with the enlarged growth. In this juncture the patient commenced to complain of a constant dull pain, with occasional pangs of acuteness, in the right hypochondrium. A tumour about the size of the first was discovered in the anterior portion of the right lobe of the liver, which felt quite hard; pressure elicited little or no pain. This increased with great rapidity, and the constant and often agonizing pains in the part, caused the patient to sink rapidly. Death occurred on the twentieth of May, 1868. By this time the lower edge of tumour reached into the iliac region. She had never been jaundiced.

Post mortem examination twenty hours after death.—Body much emaciated; a gland or two on the left side of the neck, just above the clavicle, enlarged; liver greatly thickened, especially the right lobe, which occupied the entire right side of the abdomen, as far as the ilium. There were few if any unnatural adhesions. Several of the mesenteric glands were enlarged. Weight of liver, nine pounds; it contained some dozen

or more encephaloid deposits, varying in size from that of a fœtal head to a small marble. One or two of the larger of these had softened in the centre; the largest (the tumour first discovered in the liver) was apparently on the verge of rupturing into the peritoneal cavity; it contained for the most part, a yellowish-gray diffuent pulp; others were quite hard, resembling scraped sweet potato, pressed tightly into elliptical or spherical cavities. Cancer *juice* abundant, revealing under the microscope characteristic cells. The small portion of the liver not occupied by cancerous deposits was found in a state of complete fatty degeneration; yet the gall-bladder was full of healthy-looking bile. No examination was made of the tumour filling the pelvis, further than to ascertain its identity with the depositions in the liver. Uterus healthy. Thoracic viscera not examined.

The question of chief interest in the above case turns on the character of the primary mammary tumour. For if the opinions of the operating and consulting surgeons in regard to its malignancy be correct, the case is, I believe, without a parallel in the length of immunity obtained by operation; twenty-six years having elapsed between the removal of the breast and the appearance of secondary cancer. Whilst this case may serve to strengthen the deductions of Paget, Lebert, Sibley, and others, it is calculated to cast a damper over the hopes of the hyper-sanguine, for although these distinguished surgeons are convinced, from elaborate statistics of their own, that those patients have a longer lease of life, who submit to operation, than those who do not, yet they look not for permanent recovery. Mr. Paget but re-echoes the experience of nearly every surgeon, when he remarks in reference to the prognosis of cancerous disease of the breast, after operation, "*I am not aware of a single clear instance of recovery.*" The nearest approach to this happy result falling under this author's observation, being in a woman who "lived and worked hard for eleven and a half years, without any apparent return of the disease, and died with progressive muscular atrophy of the tongue and pharynx. After death, no trace of cancer was to be found, except a few very hard white masses in the liver and gastro-hepatic omentum." (*Surg. Pathology*, p. 554.) The observations of Bennett, Walshe, Leroy D'Etioles, Lebert, Sibley, Baker, Virchow, and indeed of almost all modern pathologists, contain nothing more encouraging than the foregoing.

Mr. M. H. Collis speaks rather more hopefully¹ on this subject, although the *reasons* for the faith that is within him are not stronger than those adduced by other less sanguine authors; the case upon which he builds his strongest hopes (so far as his personal observations go) having enjoyed only eleven years' immunity. Perhaps the most flattering case on record is that of Colles, alluded to in the work of Mr. Collis, in which

¹ In his work "On Cancer and Tumours," Mr. Collis alludes to two cases of "permanent recovery," after operation for encephaloid cancer. In the first case (page 45), this conclusion was arrived at after only four years' observation; the second case mentioned (Hargrave's), page 55, after fifteen years' observation.

that surgeon removed one breast for what he believed to be cancer; the patient enjoying good health for twenty-three years, when the disease re-appeared in the other breast, was operated on by Mr. Rynd, and proved ultimately fatal.

CASE II.—Mr. N., æt. 57, a small, thin, cadaveric looking gentleman, but of extraordinary activity and industry, of regular habits, a very temperate drinker, but a remarkably hearty eater. Indeed, he early achieved a reputation in this last respect, which he maintained faithfully to the commencement of his last sickness. He informed me, that at the age of nineteen, he once ate dried raisins for a wager, and after consuming *four* pounds of these with perfect ease, he put an additional pound into his pocket, and demolished them during a two mile walk to his home in the country.

The patient first consulted me in October, 1867, for symptoms of indigestion. I prescribed, but with no good result. He suffered with sour, acrid eructations, and in spite of the whole round of anti-dyspeptics and rigid hygienic precautions, his food was vomited several hours after eating. The vomiting was not, however, a very prominent symptom at first, or, at least, was not sufficiently constant to elicit a suspicion of the true nature of the case, but the symptoms finally became so urgent (taken in connection with their history and progressive character), as to point to cancer of the *pylorus*. A lump about the size and shape of a hen's egg was detected just below the edge of the ribs, and to the right of the ensiform cartilage. It was hard, movable, and painless; indeed, the patient never complained of the slightest pain from the beginning to the end of his trouble, except an occasional sense of aching about the shoulders.

During the winter the vomiting increased in frequency; no night passed that a large portion of the food of the previous day was not thrown up, intermingled with immense quantities of ropy mucus. Stomach and bowels sometimes very tympanitic.

During the spring of 1868, the tumour in the epigastrium passed out of reach for several days, and was next discovered lodged on the *left* side of the vertebral column, close up under the ribs.

April 15. All the symptoms growing worse; vomiting invariable after food of any description, often dark and very offensive; skin dry and harsh; thirst great; water taken in any quantity eructated without effort in the course of an hour; bowels costive; emaciation progressing, with some anasarca.

May 10. It is evident that nourishment is doing him little or no good; the stomach has become so irritable that nothing could be retained for five minutes.

12th. I was called hurriedly to the patient who was supposed to be dying; found him perfectly prostrate; almost pulseless; could speak only in broken whispers, the least exertion producing syncope. Knowing the futility of applying any remedy through the stomach, I ordered four ounces of beef-tea and half an ounce of whiskey with a drachm of laudanum per rectum. In fifteen minutes the good effects of this were apparent. I ordered it to be repeated every three hours during the night, administering only twenty-five drops of laudanum with each injection, and also that nothing be given by the mouth but a little ice. On returning next morning, the patient was found cheerful, and feeling much better. He had vomited only once during the night; his sleep had been sound, and he felt nourished and refreshed.

Seeing the good which had been accomplished by the enemata, I urged upon him and his friends the importance of giving his stomach perfect rest, by substituting nutrition *per rectum* for food by the mouth. This advice being acceded to, the strongest beef-tea was prepared, and of this four ounces, together with half an ounce of whiskey, and fifteen or twenty drops of laudanum, were administered every three hours by injection. His only drink was ice water (of which he took as little as possible), and an occasional sip of an iced solution of bicarbonate of soda; his only medicine a drop now and then of creasote. Under this treatment the patient's improvement was astonishing; in less than a week he was up, dressed, and walking around the room. Vomiting scarcely occurred more than once or twice in twenty-four hours, at which times he would throw up large quantities of dark glairy mucus, very offensive at times—so much so, that the patient would sometimes declare that his alimentary tract had reversed the order of things, so that what passed in at the rectum was evacuated by the mouth.

For two weeks no food passed Mr. N.'s lips. Every two or three days a copious injection of warm salt and water was administered to insure a fecal discharge. When the bowels were much distended with wind (which was frequently the case), a little spirits of turpentine was added. By this time he was able to get into his carriage and ride over his farm two or three miles in the country; he enjoyed these drives and the society of his friends. He was in excellent spirits, and declared that he felt as well as ever before in his life, "only a little weak." About this time he was tempted to swallow a few *strawberries*, which brought on vomiting and prostration for a couple of days. At the end of the week, however, he was as bright as possible, experiencing no pain, no inconvenience whatever, yet knowing that death was inevitable, and speaking of it with the utmost composure.

Thus matters stood until about the middle of June, when he again commenced to decline. His patience was becoming exhausted, and he acquired a strong repugnance to the manner in which his doom was being postponed. His blood, too, which was at first enriched by the enemata, was becoming thinner, and the anasarca, which for a time had subsided, began to return. With no new complication these symptoms steadily increased, and with them his aversion to the enemata, which were, however, persevered in until June 27th, when he expired from exhaustion.

Post-mortem twelve hours after death.—*Stomach* only organ examined; its small end in the left side of the spinal column, it having been folded under the body of the organ, and contracted some adhesions in that position; the pylorus involved in an encephaloid growth, about the size of an orange. This tumour was nodulated on its outer surface, and divided into two lobes, connected by a comparatively small isthmus below, and a much larger one above. The organ was but little enlarged. On opening it a few ounces of dark grumous mucus were found. The growth involving the pyloric end was softened and ulcerated on the mucous surface; considerable excavations were discovered in each of the two lobes of the cancer, the ulcerated surfaces looking dark and ragged. The pylorus seemed to be perfectly closed, but by thrusting the little finger firmly into the outlet it passed through. From the appearance of things this would have been impossible but for the ulceration and softening of the obstruction. Position occupied by the stomach such, that the two lobes of the tumour acted as valves, and would have thus completely closed the pyloric

opening, even had there been less organic obstruction than there really was.

The above case teaches an important lesson in regard to the therapeutic value of nutritive enemata, a subject upon which writers on diseases of the alimentary canal are singularly silent. I am sure that if any physician could have witnessed their wonderful effect on this poor cachectic patient, who was thus kept alive for forty-six days under the most disadvantageous circumstances, they would have become much more favourably impressed with this mode of imparting strength to prostrate patients than they had ever been before, and resolved to employ it more systematically in many cases where it has hitherto been neglected.

Mr. Ormerod records in his *Clinical Collections and Observations in Surgery* (see *Medico-Chirurg. Rev.*, Jan. 1, 1847, p. 73), a case where a man was sustained *per rectum* for thirty-nine days, with a wound of the throat opening into the pharynx. At the end of the time he is represented as looking well, and in tolerably good condition.

ART. XI.—*Vaginal Ovariectomy*. By T. GAILLARD THOMAS, M. D., Professor of Obstetrics and the Diseases of Women and Children in the College of Physicians and Surgeons, New York.

MRS. S., a multipara of spare habit and remarkably excitable nervous system, had suffered for a length of time from retroflexion of the uterus. For this she had been successfully treated by Dr. James L. Brown, and for the past three years had been entirely free from any rational or physical signs of the condition until four months ago. At this time finding a return of symptoms, due to pressure upon the rectum, she sent again for her physician. Dr. Brown examined and discovered a movable cyst behind the uterus, which, in the erect and supine positions, pushed the fundus uteri forwards and occupied Douglass's cul-de-sac completely. This cyst was equal in size, when first discovered, to a large orange; was painless upon pressure, and could readily be pushed out of the pelvic cavity. Dr. Brown made the diagnosis of cystic degeneration of the ovary, and advised the patient to seek further counsel.

In accordance with this suggestion, Drs. Peaslee, Noeggerath, and myself met in consultation and carefully investigated the case. At this time we found everything in accordance with what has been already stated, and concurred in the opinion of Dr. Brown; deciding still further that the right ovary was the seat of the disease, and that the cyst was in all probability multilocular.

In discussing the subject of treatment three plans were proposed: first, that the cyst should be allowed to develop so that ovariectomy might be resorted to after some years of life had been passed in comparative comfort; second, that the cyst should be tapped *per vaginam*; and third, that the operation of ovariectomy should be performed through the fornix *vaginæ*,

in the same manner that it is ordinarily accomplished through the abdominal walls. The last proposal was made by myself, and urged upon these grounds :—

1st. I felt satisfied that the cyst being movable (as proved by the fact that the knee-elbow position would at once cause it to roll out of the pelvis) sufficient space could be obtained through the fornix vaginae to withdraw the emptied sac.

2d. I preferred this procedure to simple tapping, because drainage is very apt to follow paracentesis when practised through the vagina, which might exhaust the patient and prevent a resort to vaginal ovariectomy at a later period. Furthermore, I did not regard the increase of danger attendant upon vaginal section as very great, even if removal of the cyst proved impossible; for in case of such an occurrence I proposed simply to tap the exposed cyst and close the vaginal opening by silver sutures.

3d. I urged the adoption of the vaginal operation rather than waiting for the full development of the cyst, because of the peculiarly anxious nature of the patient. After being informed of the nature of the disease, she thought and spoke of almost nothing else; lost appetite, slept badly, and evidently depreciated in strength. From all that I could learn from her husband, who is a practitioner of medicine, from Dr. Brown, and from my own observation, I thought that she would prove a most unfavourable case for ovariectomy at time of full development of the tumour; and, to repeat a consideration just given in connection with paracentesis, I regarded the tentative process as not attended by great risk, since it involved incision only into the most dependent portion of the peritoneum.

All these views were fully laid before the patient and her husband, and at the end of a fortnight it was decided that the operation should be attempted.

Dr. Brown prepared the patient for the operation by the use of a cathartic, and kept her upon a milk diet for forty-eight hours previous to its performance. On Sunday, Feb. 6, 1870, at 3 P. M., I proceeded to operate, in presence of Drs. Peaslee, Brown, Walker, Purdy, J. C. Smith, and Sproat.

Dr. Purdy having anæsthetized her with ether, she was placed in the knee-elbow position, and secured upon the apparatus of Dr. Bozeman. This apparatus not only completely secures the patient in this position, by straps and braces, but makes the position perfectly comfortable for any length of time, and also favours the administration of an anæsthetic. To prevent all possibility of the rectum falling into the line of incision, a rectal bougie was inserted for about five inches. Sims's speculum being now introduced, and the perineum and posterior vaginal wall lifted, I caught the fornix vaginae midway between the cervix and rectum with a tenaculum, drew it well down, and with a pair of long-handled scissors, one limb of which was placed against the rectum and the other against the cervix, cut into the peritoneum at one stroke.

The first step of the operation being now accomplished, I proceeded to the second. The patient's position was changed to the dorsal decubitus, and passing my finger through the vaginal incision I distinctly touched the tumour, which had now fallen again into the pelvis, and fastened a tenaculum in its wall. With a small trocar I then punctured, one after the other, three cysts, which gave vent to about six or eight ounces of fluid which looked precisely like vomited bile. Drawing upon the cyst, it now passed without difficulty into the vagina.

For the third step of the operation the position of the patient was again changed. She was now placed in Sims's position on the left side and his speculum introduced. Passing through the pedicle at its point of exit from the vaginal roof a needle, armed with a strong double silk ligature, I tied each half of the penetrated tissue and cut off the cyst and ligature. The cul-de-sac of Douglass was then sponged, the pedicle returned to the abdominal cavity, the incision in the vagina closed by one silver suture, and the patient put to bed.

The entire operation occupied thirty-five minutes, and presented no difficulties other than those slight ones incidental to ligature of a pedicle at some distance up the vagina.

Subsequent to the operation the patient was kept quiet and free from pain by opium, sustained by fluid food, and strictly confined to the supine posture. Her only discomfort arose from sleeplessness, and nausea which followed the use of the anæsthetic, and for ten days she progressed without any unfavourable symptom. At this time being allowed to leave the bed and lie upon the lounge she exerted herself unduly, and an attack of peri-uterine cellulitis invaded the right broad ligament. The pulse became rapid, the skin hot and dry, and a phlegmonous mass as large as the fist, hard, and painful to the touch, could be distinctly felt. This soon began to diminish, and now at the end of the thirtieth day has ceased to prove a source of any annoyance, while the general condition of the patient assures me that she is entirely out of danger.

I feel confident that the attack of cellulitis which complicated convalescence in this case was not at all dependent upon the nature of the operation, but was due to indiscretion on the part of the patient in overrating her returning strength.

It is not my belief that the scope of this plan of performing ovariectomy will ever be very great, but I think that in cysts of small size, which are unattached, it will offer a valuable resource for the avoidance of years of mental suffering while disease is progressing, and of the capital operation of abdominal ovariectomy in the end, with all its attendant dangers and uncertainties. Even in a doubtful case, vaginal ovariectomy may be resorted to as a tentative measure, which, in the event of failure from attachment of the cyst, would in all probability be recovered from.

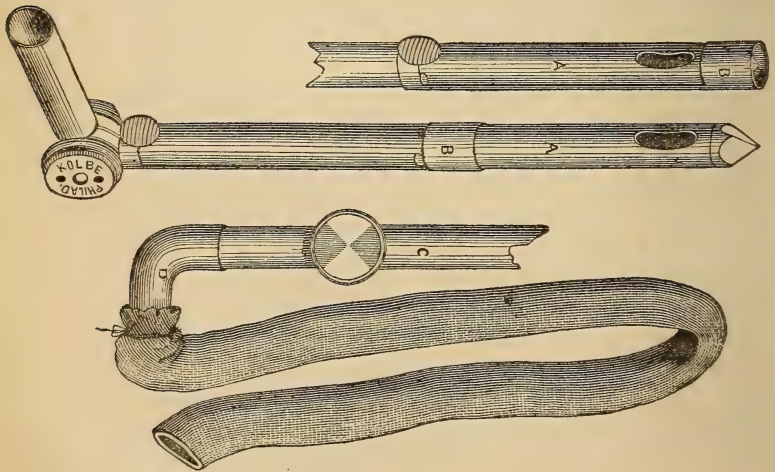
I should urge upon any one who determines to essay it, not to trust to his general knowledge of the anatomy of the fornix vaginæ and peritoneum, but to rehearse the first step of the operation upon the cadaver before attempting it upon his patient. There is often considerable space between the roof of the vagina and the floor of the peritoneum, and it usually requires two strokes of the scissors to penetrate the abdominal cavity. The first severs the vagina; through this opening a tenaculum should be passed, and the peritoneum drawn down and opened. In thin women, if the fornix be well drawn down by a tenaculum, one stroke will often open the peritoneum.

Before operating upon the patient whose case is here recorded, I made one attempt upon the cadaver, feeling confident in my ability to open the

peritoneum with certainty. The difficulty which I met with in this attempt induced me to practise the procedure on seven other dead bodies before I felt willing to attempt it on the living. After the difficulty attending this step of the operation is once appreciated, it can be readily and certainly avoided.

ART. XII.—*Description of an Ovariotomy Trocar, presenting a combination of the Trocar and Canula, with the Attachment of a Flexible Tube.* By J. EWING MEARS, M. D., Fellow of the College of Physicians of Philadelphia, etc. (With a wood-cut.)

THE instrument, represented in the annexed cut, was designed with a view to overcome some of the disadvantages which attend the employment of the present form of trocar in the evacuation of cysts in the operation of ovariotomy. An effort has been made in its construction to combine successfully the trocar and canula in such a manner as to permit of the adaptation of a flexible tube, by means of which the fluid is rapidly and without waste conducted to the proper receptacle. It consists essentially of a canula (A), armed with a trocar-point, which can be covered by a



guard (B), with a valve controlled by a hinge-joint, and a flexible tube (rubber) of sufficient length attached to a metallic neck (D).

The diameter of the canula is $\frac{1}{16}$ th of an inch, and is made this size in order to afford an easy and rapid flow to the viscid, gelatinous fluids usually found in ovarian cysts. Immediately behind the trocar-point is an elliptical opening, corresponding in size to the diameter of the canula, through which the fluid passes into the canula. The guard is moved by a rod,

which is attached to a ring, and adapts itself closely to the surface of the instrument. The valve is controlled by a hinge-joint, and is open when the joint is turned in the direction parallel with the long axis of the canula. This form of valve was adopted in order that the calibre of the canula should be preserved throughout. The flexible tube is made of the fine rubber cloth, and should have a diameter of not less than one inch. The ordinary rubber tubing is too heavy and unwieldy.

The central figure represents the instrument in the position for introduction, the point unguarded, and the valve closed. The closure of the valve by turning the joint in the direction perpendicular to the long axis of the canula forms a handle, as it were, by means of which the instrument can be firmly grasped by the operator. When introduction has been effected, the guard is projected to cover the trocar-point, the tube attached, and the valve opened as represented in the upper and lower figures.

The guard was adapted to the instrument in order to avoid a possible accident in the wounding, by the trocar-point, of any vessels which might run on the internal surface of a cyst, and also to render the instrument available in cases of non-cystic dropsies, as ascites, &c.

The absence of the shoulder, produced by the canula in the ordinary trocar and canula, gives a much greater facility in introduction. An additional advantage may be mentioned in connection with its use in multilocular ovarian tumours, in the readiness with which the secondary cysts can be punctured, and their contents evacuated.

The instrument was made by Mr. Kolbe, the well-known instrument-maker of this city.

107 S. 13th Street.

ART. XIII.—*Cases of Fibrinous Uterine Polypi successfully treated.*

By J. R. PAGE, M.D., Richmond, Va.

CASE I.—Mrs. R., æt. 27, has had one child, now living, aged three years; was in good health and perfectly regular in her catamenia up to 1st Dec. 1868, at which period she was taken with pains in the back and hips, leucorrhœa and oozing of blood which lasted about two weeks, then there was a cessation of hemorrhage, but increase of leucorrhœa. About 1st Jan. 1869 she consulted a physician, as the hemorrhage again set in and was disagreeable. She “tried him” for six weeks, and took a good deal of physic, but growing worse she “tried another;” he likewise failed to afford her any relief, so about the 1st of May, 1869, she thought she would “try a third.”

Her condition when I was called in was as follows: In bed, unable to walk through profound debility. Surface pale as death, pulse quick but with little or no volume; in fact she had well nigh gradually bled to death. Ascertaining the “previous history,” I proceeded at once to investigate the cause of her menorrhagia, and found the body of the womb enlarged about fourfold its normal size, with right antero-lateral version. The os and cervix uteri dilated enough to pass a No. 7 flexible gum catheter (which I had along with me). I found on examination that the anterior right half of the womb was occupied by what presented *the feel* of a placental mass; but could not decide upon that as the cause of trouble,

inasmuch as Mrs. R. insisted that she had not been pregnant at all since the birth of her living child.

To stop the hemorrhage was the point first to be attended to. Having at hand a vial of liquor ferri persulph., I injected the cavity of the uterus with a solution of one drachm liq. ferr. persulph. to one ounce of water, which served only to coagulate the exuded blood, but not to stop its flow. I then introduced a sponge tent, and ordered internally fluid extract of ergot, and large doses of tinct. ferri chlorid. and potass. chloratis.

Visiting patient eight hours afterwards I removed the sponge tent, and could then pass the index-finger through the os internum. The mass in utero covered a space apparently about 3 by 4½ inches; to the finger it presented the feel of fresh liver, and the mass was evidently "submucous" and "fibrinous." The blood seemed to ooze from the entire surface of the tumour. At our second visit we were armed with ammonio-ferric alum, a large sponge tent and medicated pessaries (composed of tannin ℥j; ext. belladonnæ, ext. opii liquid., each ½ grain; cocoa-butter q. s.)

After carefully washing out the womb with *hot* water, we then injected a saturated solution of ferric alum into its cavity; this of course soon passed out, and we regret to say did not stop the oozing. We then passed in a medicated pessary composed as above stated, and then the sponge tent, and then carefully tamponned the vagina with raw cotton, ordered a continuance of the iron and chlorate of potash and ergot. Found at our next visit that the oozing was well nigh stopped, but there was a good deal of pain over the lower part of the abdomen. This we attributed to the ergot; as there was no feverish action about the pulse. Discontinued the ergot, kept on with iron and potash mixture; renewed the medicated pessary, and closed the os uteri with tanno-glycerine on cotton, and tamponned vagina.

Next visit, found tampon saturated not with blood, but a sero-sanguinolent discharge, and in a few days this changed to a discharge composed of fibrinous shreds and muco-pus.

Gradually, that is, in four weeks, *this* discharge gave place to leucorrhœa; patient's general health improved; the uterus gradually grew smaller, the "fibrinous submucous" polypus sloughed off and was discharged, and in eight weeks' time the organ resumed its natural position, and our patient, early in July, went on her way rejoicing, and is now a hale hearty woman.

CASE II.—This was very like to Case I., differing, however, in these particulars.

Evelina, æt. 40, married, one child grown. Never had but one; irregular in monthly periods, her menstrual discharge being sometimes too profuse, and then absent for several months.

Alike in this: antero-version very profound, no lateral flexion, however. Menorrhagia for four months, hardened os uteri, but patulous; intense spanæmia; no appetite; no strength. Same kind of tumour filling the upper half of the uterus; broad base; livery feel; oozing blood.

Treatment, injections of ferric-alum in uterus, then *mopped out the cavity* with glycerine ℥j to carbolic acid ℥ij; tamponned vagina with cotton previously saturated with ferric-alum. Internal treatment, iron and potash; then quinia and assafœtida. This treatment persevered in for six weeks, patient able again to resume work. Tumour disappeared.

TRANSACTIONS OF SOCIETIES.

ART. XIV.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1869. October 6. *Case in which the Cæsarean Operation was practised. Death of Mother on seventh day from (supposed) Intestinal Obstruction; Child living.*—Dr. WALTER F. ATLEE read the following case:—

September 17, I was called by Dr. W. H. Hooper to see Mrs. O'H., for the purpose of practising the Cæsarean operation. Twice before she had been delivered of a child at term by embryotomy. When I reached the house, in company with Dr. Hooper, Dr. Boker, and Dr. Fassitt, the patient had been in labour for several hours. She was thirty-one years of age, and apparently a very healthy woman. The child was alive and at full term. The mouth of the womb was open to the size of a silver dollar. The membranes were intact. As nearly as could be ascertained, the antero-posterior diameter was not over two inches.

The patient consented without hesitation to the Cæsarean operation when it was proposed to her. The bowels had been freely opened by oil in the morning. The bladder was emptied by the catheter. Chloroform was administered. Probably two drachms were used before she was sufficiently insensible to pain. The incision was made through the linea alba, as nearly as could be in the median line of the body, and about six inches in length. The womb was divided by incisions, made quickly, but not too profoundly, to avoid opening the membranes containing the child. The placenta was found directly under the line of incision, and was detached and dragged out, the membranes being, of course, opened in so doing. The child was delivered by the breech. The delivery was accomplished with difficulty, a part of the head being firmly held in the superior opening of the pelvis. Some blood was lost during the incising of the womb, but, certainly, not more than is lost in ordinary labour. After the contraction of the womb there was some difficulty, owing to the small number of assistants, in keeping the intestines inside the abdominal cavity.

The wound in the womb was simply well cleaned; that in the walls of the abdomen was sewed together with gilded silver wire, a narrow compress was placed over it, and a bandage applied around the abdomen. Until the 21st, or for four days, only barley water was given as nourishment. Opium was given regularly. The urine was drawn off morning and evening. The lochial discharge was as usual, as well as the secretion of the mammary glands. On the 21st, being four days after the operation, the bandage was removed, and the wound was found to have healed by first intention. There was no tenderness any-

where, except in the left iliac region, where the patient said it felt sore, and shrunk from having it pressed. There was, however, on this day considerable tympanitic distension. The pressure of the bandage was pleasant, and the woman asked to have it applied tightly. There was no chill at any time, the lochial discharges were as usual in quantity and quality, and the mammary glands performed their functions.

The patient died on the 23d, at 9 o'clock P. M., and, probably, from enormous tympanitic distension in the abdominal cavity. There was no passage from the intestines after the operation. No post-mortem examination could be obtained.

The physician who had attended this woman after her second confinement, informs me that a very large pelvic abscess formed at that time and opened into the rectum. The obstruction in the intestines, from which she died, at least in my own opinion, may have been caused by incarceration under some fibrous band, the result of pelvic abscess; or may have been the result of intussusception, or of knotting of the small intestine. There was more handling of the intestines than there would have been with a greater number of assistants at the time of the operation, but no more could have been obtained without a loss of time that might have been exceedingly disadvantageous.

December 15. Effects of Chloral, Chloroform, and Ether hypodermically employed.—Dr. S. WEIR MITCHELL exhibited three pigeons under the influence of chloral, chloroform, and ether, respectively. One bird had received a dose of chloral, gr. iv, by hypodermic injection, five hours previously, at 3 P. M., under the influence of which it still remained in a state of profound stupor or sleep. Another bird had received two hypodermic injections of chloroform, gtt. x, at 3 P. M., and gtt. x, at 6 P. M.; and a third pigeon had received two hypodermic injections of ether, gtt. xxv to xxx, at 3 P. M., and again at 6 P. M. The last two pigeons were in deep sleep, but could be aroused by shaking. Dr. Mitchell had been led to employ chloroform from the supposition that the effects of chloral might be due to the liberation of chloroform in the system. He had subsequently found, however, that Dr. B. W. Richardson, of London, had done the same thing; and indeed that several British journalists were acquainted with the effects of chloroform when hypodermically injected. Dr. M. had found, however, that the dose of chloroform required to produce sleep was greater than the amount of chloral capable of producing similar effects could contain. He suggested that the formate of soda, the other product of the decomposition of chloral, might produce some part of the effect. It was to be remembered that some of the French observers had denied that chloral does undergo decomposition in the system. The effects of ether and chloroform also appear to pass off more rapidly than those of chloral. To show the remarkable difference in the susceptibility of pigeons to different hypnotics, Dr. M. had administered extr. opii gr. i. (fifty) to one of these birds during the same day, without producing the least narcotic effect.

Dr. H. C. WOOD, JR., remarked that probably the difference in the action of chloroform when given in the three different ways—by inhalation, by the mouth, and hypodermically—might be accounted for by the differences in the rapidity and degree of absorption. When ordinary doses were given by the mouth, he thought it was resolved into vapour and merely produced a local effect; although it is true that a dose of fʒj of

chloroform will narcotize. When it is given by the lungs, narcosis is rapidly produced, and it is doubtless in this way that a paralyzing influence on the heart is most positively exerted. When it is used hypodermically, it is probable that intermediate effects are produced. Dr. W. was not inclined to regard it as likely that chloral is decomposed, since, after its administration, the breath is distinctly tainted with the odour of the drug. He also mentioned that he had succeeded in inducing profound anæsthesia in a cat by the vapour of cold alcohol.

Case of Bony Union after Intra-Capsular Fracture of Cervix Femoris.

—Dr. JOHN H. PACKARD presented, through the courtesy of Dr. J. M. Adler, a specimen of united intracapsular fracture of the neck of the femur.

The specimen consisted of the upper part of the right femur, in which bony union of an intracapsular fracture had apparently taken place. A vertical section had been made through the head, neck, and trochanters. The history of the case was as follows: The patient, an old lady, æt. about 65, was partially hemiplegic, and suffered from paralysis of the neck of the bladder. By a fall from her bed, she sustained at the same time a fracture of the cervix femoris, and another of the lower end of the right radius. Her foot was inverted, the leg shortened, and there was pain in the groin and hip-joint, and crepitus. The femoral fracture was diagnosed as intracapsular, and treated with a straight splint, extension and counter-extension being made by means of adhesive plaster. The apparatus was removed in seven weeks.

Five months after the receipt of the injury the patient died. The capsular ligament was found untorn and its interior healthy.

Dr. HEWSON called attention to the resemblance of this specimen to one in the possession of Sir R. Adams, and figured in his work.

On motion, the specimen was referred to a committee consisting of Drs. Packard, Hewson, and John Ashhurst, Jr., which presented the following report January 19, 1870:—

“After careful study of the specimen, we are convinced that it is one of genuine bony union of an impacted intracapsular fracture of the cervix femoris.”

1870. January 19. *Suspension of Intestinal Secretion and Failure to produce Purgation after Section of the Par Vagum.*—Dr. H. C. WOOD, JR., said:—

I believe the Fellows of the College are generally aware that during the past summer I was engaged in an elaborate investigation into the action of certain alkaloids upon the heart and nervous system. In the course of this inquiry, after cutting the pneumogastric nerves and administering drugs, I was surprised to find that veratria and the allied alkaloid veratroidia failed to purge or vomit. I was at first disposed to assign this to idiosyncrasies on the part of the animals under observation; but upon investigation of the subject it became evident that this was not the cause, for when my experiments had reached nearly thirty, combinations of the strongest cathartics had still uniformly failed to produce purgation. Arsenic, one of the most certain purgatives in the lower animals, failed in a number of cases. In order to render the experiments satisfactory, I, in some instances, purged the animal with calomel, and on the following day administered double the dose, adding one or two drops

of croton oil and ten grains of extract of jalap; but the bowels remained unmoved. The intestine was found pale, almost bloodless, with sometimes a little reddening of the mucous membrane. I was the more astonished at the failure, because the pneumogastrics are stated, in our works upon anatomy and physiology, to have no direct relation to the bowels. I have found, however, that Mr. Kollman, in a prize essay published in the *Zeitschrift für Wissenschaftliche Zoologie*, Band x., states that he has distinctly traced their distribution to the whole length of the intestine; and I have an impression that one or two English authorities have made a similar avowal. In looking up the literature of the subject I learned that Sir Benjamin Brodie, in a paper published in 1814, mentions the failure of purgatives under circumstances similar to those which I have described. He employed arsenic, but his observations were only four in number. Dr. Reid, however, repeating Brodie's experiments, claims that he has found arsenic to increase the intestinal secretion as much after section of the par vagum as in the uninjured animal. I must, however, regard Dr. Reid's observations as faulty. Only in one case does he mention the occurrence of purgation, while in the others he found merely mucus in the bowels, nothing being known as to how much was there before, and how much was secreted after the administration of the drug. I almost doubted the correctness of the statement that purging was produced at all, until my 25th experiment, when the bowels were violently operated on. Slight purging occurred in the 26th case also. Thus my observations show that in most instances it is impossible to produce purgation after section of the pneumogastric nerves, but that in a few cases there is a deviation from this rule. These are the facts; what explanation can be offered?

Bernard and Schiff agree that if the pneumogastrics are cut in the neck, secretion is arrested in the stomach; if cut below the diaphragm secretion in the stomach is not affected. It is very difficult to divide the nerves in the cat (the animal on which I have operated) satisfactorily at this latter point. I have endeavoured to do it, and have heretofore failed; but am willing to accept the results of these authorities. Schiff explains the arrest of the gastric secretion by the disturbance of the action of the heart and lungs. Now it is evident that arrest of secretion in the stomach must be identical in character with arrest of secretion in the bowels, and it is difficult to see exactly how this can depend on disturbances of the thoracic organs. I have therefore endeavoured to form some other explanation of the facts, but am not, as yet, willing to commit myself to any theory. One that immediately suggests itself is, that the par vagum is the vaso-motor antagonist of the abdominal sympathetic, since it has been found by Schiff, Bernard, and others, that when the splanchnic nerves are cut the vessels of the intestine are dilated, and that when they are galvanized or otherwise excited, the capillaries contract. Bernard has also proved that section of the pneumogastric in the neck causes the gastric mucous membrane to become pale.

Dr. Wood also said: After section of the pneumogastrics in the neck it is practically impossible for the animal to swallow. I therefore, in some instances, administered the purgative from one to three hours before cutting the nerve. Sometimes catharsis had already commenced at the time of the operation; in such cases it then ceased. If it had not previously occurred it did not afterward take place. Arsenic and veratria were generally administered hypodermically.

Dr. WM. PEPPER said: The very interesting communication made by Dr. Wood appears not only to possess much value in regard to anatomy and physiology, but to be of even greater importance in its bearing upon pathological states of the sympathetic system in man. By the amount of light thrown upon the functions of the abdominal sympathetic and by the greater degree of accuracy obtained in the investigations of late years, we are enabled to refer an increased number of diseased conditions to disorders of this nerve. One of the most positive influences exerted by the nervous ganglia of the abdomen appears to be upon the secretion of the intestinal mucous membrane. Thus the evidence is gradually accumulating in relation to the dependence of cholera upon paralysis of these nervous centres from over irritation; and there are other analogous conditions which are unquestionably due to a similar morbid action. The cases of section of the splanchnic nerves in lower animals, attended with profuse serous purging, show the result of entirely withdrawing the influence of the sympathetic nerve, and tend to confirm the theory advanced by Dr. Wood to explain the phenomena observed in his experiments. There is another symptom of diseased action of the sympathetic which depends upon the connection between abnormal states of the abdominal ganglia and the condition of the cutaneous capillaries. The marked effects which injury of the abdominal sympathetic produces, the pallor, the reduction of temperature, the diminished pulse and arrest of cutaneous circulation, are probably all evidences of the vaso-motor power possessed by this portion of the nervous system. I have recently met with two cases in which, from pressure upon, or direct lesion of, the sympathetic ganglia in the abdomen, the function of this nerve was apparently disordered; in both cases profuse sweating occurred. One patient was under my observation for eighteen months, suffering with an abdominal tumour of either aneurismal or cancerous nature. One of the symptoms most constantly complained of was profuse sweating. The skin was drenched in perspiration, so that, although he was a cleanly person, an unpleasant exhalation could not be prevented. It was a remarkable fact that by altering the patient's position, so as to alter the pressure, the sweating could be confined to one side; obstinate constipation was conjoined with this condition. As no post-mortem examination was permitted it was impossible to ascertain with accuracy the portions of nervous structure which were affected. In the last few days (through the courtesy of Dr. A. H. Smith, who called me in consultation) I have had the opportunity of studying a second case in which this combination of obstinate constipation and profuse sweating was present. In this latter instance the disease consisted of encephaloid cancer of the abdominal lymphatic glands. At a point behind the pancreas, and corresponding to the seat of the solar plexus of the sympathetic, the diseased glands formed a large flattened mass, closely adherent to the vertebral column posteriorly, and to the pancreas anteriorly. Although it was impossible, owing to the circumstances of the autopsy, to make a careful dissection of the nervous ganglia and branches, there can be no doubt that they were involved in, or pressed upon by the cancerous mass. These two cases were brought to my mind by the remarks of Dr. Wood, and as both of them presented unusually profuse sweating, with marked dryness of the mucous membrane of the intestine, I thought it might be interesting to speak of them, although informally, at this time. I propose, however, to publish the cases *in extenso*, with remarks, at an early day.

Dr. H. C. WOOD, JR. I omitted to state my observations in regard to vomiting. Schiff says that after section of the pneumogastrics, vomiting can occur so far as the movements are concerned. He injected peculiar food which could be certainly recognized again, through the œsophagus into the stomach; and after repeated attempts it was thrown up. He also states that he had vomited dogs with tartar emetic after division of the nerves near the cardia.

I have tried arsenic and veratria. They certainly always failed when the pneumogastrics were cut in the neck.

Pyæmia simulating Rheumatism.—Dr. JAMES H. HUTCHINSON read the following report of the case:—

The case which I am about to report to the College, while it is by no means regarded as an isolated one, presents so many points of interest and illustrates one of the rarer forms which pyæmia may assume, that it is believed it will prove of interest to the Fellows.

The patient, John G., an Irishman, aged thirty-three years, was admitted into the lower surgical ward of the Pennsylvania Hospital March 25, 1869, in consequence of a swelling of the knee, which was represented as the consequence of having fallen upon a rusty nail, in this way a flesh wound of the inner part of the left thigh, just above the patella, being inflicted. The wound seems to have been slight, and was already healed at the time of his admission. In spite of the swelling of the joint, Dr. Hewson, the attending surgeon, saw no reason to believe that the nail had entered it. On the 28th of March the patient had a decided and well-marked chill, followed by profuse sweating. A few days afterwards it was noticed, for the first time, that several of the large and many of the small joints were swollen, red, and painful, particularly the left knee—the original seat of the injury—both wrists, the right shoulder, and the joints of the fingers of both hands. A few days subsequently the ankle-joints became involved, but not to so marked a degree as the joints already alluded to. It is said that a second chill did not occur, but it was observed that the patient sweated freely, especially in the afternoon. He was transferred, April 5, to the medical ward as a case of acute articular rheumatism. When admitted into my ward, the knee, the shoulder, the wrist, and finger-joints were still swollen and red, and although fully recognizing that the disease with which I had to do was not acute articular rheumatism, as it is rare in that disease to have so many articulations involved at one time, and very infrequent to have the smaller joints affected, I was inclined to believe that the case was one of what is generally known as rheumatic gout, or, as it has been recently called by Dr. Garrod, rheumatoid arthritis; and it was not until I had carefully studied the case, for the purposes of a clinical lecture, that I discovered its real nature. The following are the symptoms observed at that time: Great swelling of the left knee, evidently dependent upon effusion into the joint; redness not so intense as is usual in rheumatism; swelling, and a painful condition of several of the other joints; great frequency and feebleness of the pulse; anxious and hurried respiration; a moderate increase of the temperature; excessive prostration; profuse perspiration, which had a marked tendency to recur at about 4 P. M. every day, and had not the peculiar acid smell so characteristic of rheumatism; a hay-like or sweetish odour of the breath, and a light straw-yellow tint of the skin. The patient complained of great pain when moved, and even at this stage raising him in bed occa-

sioned so much discomfort that auscultation of the back of his chest was performed with difficulty. Its anterior surface was frequently examined, and no sign of disease of the lungs could at this time be discovered. The præcordial region was, of course, included in this examination, and no physical sign of inflammation of the pericardium or endocardium, or other disease of the heart, was at this or any subsequent period of the disease detected.

The following indicates the state of his pulse, respiration, and temperature from April 5 to April 10, inclusive :—

	Pulse.	Respiration.	Temperature.
April 5, P. M.	88	32	100 $\frac{2}{3}$ F.
" 6, A. M.	110	38	102
" 6, P. M.	106	42	100
" 7, A. M.		30	99 $\frac{1}{2}$
" 7, P. M.		28	99
" 8, P. M.		40	101
" 9, A. M.		28	100
" 9, P. M.	118	38	102
" 10, P. M.	Running.	52	102 $\frac{1}{2}$

On April 10 the following note was made: Patient extremely ill, all the symptoms having assumed during the past few days an extremely typhoid character; is delirious at night, and during the day lies flat upon his back, with his eyes open, muttering to himself in an incoherent manner. Although he is with difficulty roused to answer questions, his answers are intelligent and intelligible. There is subsultus tendinum to such an extent as to interfere materially with a correct appreciation of the frequency of the pulse. There are no signs or symptoms of cardiac complication; nor is there material alteration in the character of the renal secretion, but it, as well as the feces, is frequently passed involuntarily. The skin is now of a decidedly greenish hue. Pain and swelling of the joints still continue, and the pain is so great when a physical examination of the posterior surface of the chest is attempted, that it can only be made in a very unsatisfactory manner. The only physical signs of disease which can be detected are slight dulness on both sides, posteriorly, together with coarse, crepitant rales diffused throughout the lungs. The dulness was not, however, sufficient to induce the belief that there was hepatization, or other consolidation of the lungs, and it was attributed to congestion.

State of the pulse, respiration, and temperature from April 12 to April 17, inclusive :—

	Pulse.	Respiration.	Temperature.
April 12, P. M.		46	101 F.
" 13, P. M.		38	101 $\frac{3}{5}$
" 14, A. M.		50	100
" 15, A. M.	108	36	100
" 15, P. M.	110	36	100 $\frac{1}{2}$
" 16, P. M.	112	36	101 $\frac{1}{2}$
" 17, P. M.	112	34	101 $\frac{1}{2}$

April 16. In consequence of the profuse sweating, there is, all over the surface of the patient's body, a copious eruption of sudamina; many of the minute vesicles have developed around themselves red areolæ, which are somewhat elevated above the surrounding skin, and in many cases the vesicle has become a pustule. This eruption in some places bears a slight resemblance to the rose-coloured spots of typhoid fever, but is readily distinguished from these by a close examination, which generally enables

the observer to detect the vesicle, or pustule, seated at the summit of each papule. That there is some resemblance is shown by the fact that two of the physicians who have seen the case are inclined to think it one of typhoid fever complicated with rheumatism.

On the 17th of April a large abscess was discovered on the inner side of the left knee, near the seat of the original injury, producing a swelling and deformity of the part very different from that which was noticed when the patient first entered the ward. On the day following, the redness over the abscess had increased, and, with the consent of Dr. Hewson, the case was transferred to the surgical ward, where the abscess, which was clearly a secondary one, was freely laid open. Recovery ultimately took place, but the convalescence was unusually protracted, and the man for a long time bore in his appearance the traces of the severe constitutional disease to which he had, on more than one occasion, nearly succumbed. He was finally discharged from the hospital on July 23, after a stay of 119 days. And of his subsequent history little is known, except that on one occasion he was seen by Dr. Charles T. Hunter, one of the residents of the hospital, who tells me that there was impaired function of the left knee-joint, but apparently no disorganization of any of its important structures.

It is scarcely necessary to add that as soon as the real nature of the disease was recognized, the treatment consisted in stimulants, tonics, and beef-tea—tincture of the chloride of iron being given in doses of twenty drops every two or three hours.

To those among the Fellows of the College who think that pyæmia is an invariably fatal disease, the circumstance of this man's recovery will form an insurmountable objection to the acceptance of the diagnosis of pyæmia affecting principally the joints; but reference to several papers on the subject has convinced me that a recovery from this disease is by no means impossible. Thus, Bristowe, in his article on Pyæmia, in Reynolds's *System of Medicine*, says a certain proportion of cases recover; and Savory, quoted by Braidwood, says: "In acute and well-marked pyæmia one can hardly venture to admit a ray of hope. On the other hand, as a general rule, the longer the patient can struggle against the mischief, the more chance is there of his being ultimately rescued from the perils through which he has to pass."

I find also, by reference to the above and other authorities, that the affection of the joints is perhaps not so uncommon a manifestation of the disease as many of us might be inclined to suppose. Bristowe (Reynolds's *System of Medicine*, vol. i. p. 218), in the article above alluded to, says that it frequently happens that pain and swelling attack the joints, small as well as large, and other superficial parts, and subside without leading to further mischief; and in another place speaks of the liability to mistake this disease for acute articular rheumatism. Braidwood, in his monograph on this subject, reports cases presenting rheumatic symptoms, and in addition to expressing his own conviction on the subject, quotes Paget, who says: "The nearest affinities of chronic pyæmia are with rheumatism through gonorrhœal or urethral rheumatism." A similar opinion is expressed by Wilks, in his article in *Guy's Hospital Reports*, Series III., vol. vii. p. 133. He not only holds that the joints may be secondarily involved and disorganized, but says: "As regards the joints, it will be noticed, on the perusal of the cases, that in those that were acute, and the course of the disease rapid, nothing was observable but increased

effusion into the synovial membrane," and adds that "chronic cases are very apt to involve the joints and not unfrequently terminate in recovery."

The eruption was so prominent a feature of the case that it will be recollected it caused it to be mistaken for one of typhoid fever; but the eruption of the character witnessed in this case appears to be by no means an infrequent occurrence in pyæmia, for Bristowe says: "The sudamina are sometimes surrounded by a zone of congestion, which, by a careless observer, may be mistaken for the spots of typhus or enteric fever," and Mr. H. Lee, Dr. Wilks, and, I think, Braidwood, refer to it. It may be well to add to this that there were no symptoms of either typhus or typhoid fever, except excessive prostration, present, and it will generally be admitted, it is thought, that the so-called typhoid state is a necessary accompaniment of the disease under consideration.

The slight severity of the original wound, and the fact that cicatrization had taken place before the occurrence of the first chill, may be regarded by some as sufficient reason for the exclusion of the diagnosis; but there are cases on record that prove that the existence of an open sore is by no means essential. Thus, Wilks, in the admirable paper already alluded to, reports a case in which the disease occurred some time after the wound made by the removal of an epithelial cancer of the lip had cicatrized, and also other cases in which the only apparent exciting causes were either unopened abscesses or internal abscesses, and refers to the fact that gonorrhœa or leucorrhœa may often be the starting point of suppurative fever.

In this connection it may be well to allude to the great resemblance which certain cases of the so-called gonorrhœal rheumatism bear to the disease of which I at first thought my case was an instance—rheumatoid arthritis; and Paget's views on this point, which I have incidentally quoted, confirm an opinion which I have held for some time—that the latter disease and rheumatoid arthritis are essentially the same, and the case which I have reported to-night induces me to believe that there is some connection between these two and pyæmia affecting the joints, even if the relation is as yet ill-defined and vague.

Dr. B. H. COATES related a case of pyæmia that had occurred many years before, the true character of which was then, of course, unknown. A boy, while fishing, was wounded in the vicinity of the knee-joint, and secondary abscesses resulted.

Dr. CASPAR MORRIS.—I was about to refer to the same case. It was, I think, in 1824 that the patient came under our observation at the Pennsylvania Hospital. We were told that the knee-joint wound had been caused by the sharp fin of a catfish. In the state of pathological knowledge which then existed we were disposed to refer the subsequent conditions to some special poison connected with the fin. The man finally died, with swellings of all the joints and symptoms of pulmonary phthisis. We who have been so unfortunate as to meet with many cases of pyæmia in parturient women, have seen occasional instances of recovery, and in such cases I have been disposed to look upon abscesses in the limbs as a favourable symptom.

Dr. F. F. MAURY stated that he had seen two cases of recovery from pyæmia, following surgical operations.

Dr. ASHURST said that among a large number of cases of pyæmia which had come under his observation, he could then recall only two instances of recovery. One of these cases was like that reported by Dr.

Hutchinson, except that the symptoms were milder; the patient at no time appearing in great danger from the pyæmic condition. The case was supposed by some of those who saw it to be one of acute rheumatism. It occurred after primary excision of the radius for a gunshot fracture, the pyæmic symptoms (among which articular pains, extreme debility, and the peculiar hue of skin were prominent) not being developed until the wound was nearly healed. The other case, by a curious coincidence, also occurred after excision of the radius for gunshot fracture. This was a secondary operation, and the portion of bone removed was about four inches in length. The patient was attacked with rigors on the tenth day, and was extremely ill for about a fortnight during very hot summer weather. Abscesses formed above and below the wound, but did not involve any important structures. This patient eventually recovered with a good limb. His treatment consisted of stimulants, concentrated food, and quinia. The rigors yielded after a week to large doses of this drug, and at the end of another week he became convalescent. Dr. Ashhurst added that his experience confirmed Dr. Hutchinson's remark that only chronic cases get well; the acute cases invariably die. Death sometimes seems to occur most quickly in those cases where the condition is that which has been called "septicæmia," a putrid poison being absorbed into the blood. In these instances there is not time for the development of the characteristic anatomical changes; the morbid condition in the lungs often not advancing beyond the stage of congestion.

Dr. COATES asked if pyæmia was not more frequent and destructive among those whose health was already broken down, and who were crowded together, as in military hospitals.

Dr. ASHHURST replied that such was not his experience; the most rapidly fatal cases which he had seen had been among labouring men with every appearance of robust health. It was, he thought, found by hospital surgeons that pyæmia was most apt to occur after primary operations for injury; the patients in such cases being usually healthy. Patients previously worn down, and who had undergone secondary operations, might die from various depressing conditions, pyæmia being one; but it was at least not more frequent in such cases than in those of primary operation for traumatic causes.

Dr. BACHE said: In the summer of 1852, a young man of healthy appearance, having a gunshot wound of the left hand, was admitted into the Pennsylvania Hospital. The injury was a severe one, the hand being much torn; nevertheless, an attempt was made to save it. Subsequently hemorrhage occurred, to arrest which pressure at the wrist was tried ineffectually. Then the radial artery was tied; after this, as the hand sloughed, the arm was amputated above the wrist. For a time the patient appeared to do well; then the pulse became rapid, pains in the joints with redness set in, and the case terminated fatally in about ten days. Death was attributed to rheumatism caused by damp floors, as the ward had been scrubbed about the time inflammation of the joints was first noticed. From what we now know, I have no doubt that this case was, in fact, one of acute pyæmia.

Chloral in Asthmatic Bronchitis.—Dr. CASPAR MORRIS said: I was recently in attendance upon a lady who suffers from frequently recurring attacks of bronchitis, with asthma. The skin was hot, the frequency and difficulty of respiration very great, the râles loud and musical, and the

secretion very profuse, so that the mucus could be poured from the cup in an abundant, ropy stream. My attention had been arrested by the account, recently published, of the hydrate of chloral, and as she had not been relieved by any remedy which I had previously tried, except to a slight degree by chloric ether, it occurred to me that the chloral might be of service. I ordered five grains in one fluidrachm of the syrup of lactucarium of Aubergier, to be repeated in two hours if required. The two doses afforded entire relief; and she has found great comfort since from a single dose taken at bedtime; a good night's rest being secured by it. I mention it as a valuable aid in the treatment of this intractable and distressing disease.

1870, Feb. 2. *Report on Meteorology and Epidemics.* W. L. WELLS, M. D., read the following report:—

In 1869 there were reported at the Board of Health in Philadelphia 14,786 deaths; 93 more than in the preceding year, and 853 more than in 1867; less, however, than in any one of the five years preceding 1867.

Taking the population at 800,000, this makes one death in 54.1, or 1.84 per cent. of the total population, a proportion which compares very favourably with other cities whether in this country or in Europe.

The deaths among males amounted to 7644; among females to 7142; 3370 were males over 20 years of age; 4274 were male children; 3313 were females over 20; 3829 were female children—making 6683 adults and 8103 children. 813 were people of colour.

The number above given as the total includes the stillborn—789—and those who died in the country and were buried in the city, 569 in number. On deducting these we have remaining as the deaths in the city, 13,428, one death in 59.6, or 1.67 per cent.

On comparing the different months we find that, as is always the case, July shows most deaths, although as compared with the year before, when July was very hot, there was a diminished mortality; 1900 died in July, 1868, and only 1710 in 1869. On the other hand, August was in the past year nearly as hot as July; the average temperature of the month being equal to the average of July for forty-five years. We find accordingly 1654 deaths in August, 1869, nearly equal to those in July, and exceeding by 84, August of the year before, when 1570 only died.

In September of the past year, the mortality had diminished so much that the whole number of deaths was not equal to those among minors alone the month before, and not equal to the deaths among children under five years of age in July. September was the healthiest month in the whole year. There were only 994 deaths.

March was remarkably wet and cold, and showed an increased mortality; April, on the other hand, was warmer by $2\frac{1}{2}$ degrees Fabr., and dryer than the average, and showed a diminished mortality. In March nearly 300 more, and in April nearly 200 less died than in 1868. In November and December, the mortality was in each case about 200 greater than in the year before.

In 1869 there were 457 stillborn males, and only 332 stillborn females; and this excess in the mortality of male children at birth continues for several years, reducing their proportionate excess in number at birth, until at the period between 10 and 15 the females are more numerous than the males, and so continue, the difference constantly increasing,

until between 80 and 90, there appear by the last census reports 1006 females to 518 males ; and between 90 and 100, 134 females to 51 males.

On comparing the deaths at different ages with each other, and with the population at the corresponding periods, according to the census reports, we are met by various circumstances which render it difficult to attain to accuracy. Some of these were mentioned in the last report made to the College on this subject. Another and not the least imperfection in the census reports, originates, it would appear, from the desire of many women to be considered young ; for to this cause chiefly must be ascribed the fact that there appear on the census reports of 1860 for Philadelphia, more than 200 more females between 15 and 20 than between 10 and 15, and nearly 5000 more between the ages of 20 and 30 than between 10 and 20. Between the ages of 40 and 50 there are still traces of the operation of this cause, but they show themselves in the opposite way. The number of women between those ages is very small, if we are to believe the census, less than the number of men ; and reduced to an extent for which the mortality at that period of life hardly begins to account. Beyond the age of 50 the women again are more numerous than the men ; although here the action of this cause has probably ceased, as after 50 there is probably no more, or comparatively very little more desire to be thought young.

It is only in comparing the deaths with the *census reports* for the different periods that this particular cause need be taken into consideration ; it has of course no influence on the report of deaths at the Board of Health.

In Philadelphia in 1869 the greatest mortality among children under 1 year, was in July, viz., 757, and next in August, 575. May was the healthiest month for them, as only 229 died, less than one-third of the deaths in July. The total deaths under 1 year were 3535, 825 of them from diseases of the stomach and bowels, a smaller number than usual.

Among children between 1 and 2 most died in August, viz., 220, and next in July, 188. After this age the influence of cholera infantum is scarcely felt, as the mortality between 2 and 5 years was greater than either in July or August in four different months, viz., December, November, June, and March. In December, when most died, 61, or not far from half the 150 deaths between those ages, were caused by scarlatina. The deaths from scarlatina in children between 2 and 5 in the whole year were 411, about one-third of 1292, the total mortality between those ages.

Croup was more fatal, in proportion to deaths from other causes, at this than at any other period, causing 122 deaths, retaining the full severity which it possessed between the ages of 1 and 2, when 55 died, while the deaths from almost every other disease which prevailed between 1 and 2, except scarlatina, had diminished in number.

Diphtheria was also most fatal between the ages of 1 and 5, causing 93 deaths, the total number from that cause being 182.

Between the ages of 5 and 10 scarlatina caused 179 of the 562 deaths.

Between 10 and 15, December showed the greatest mortality, June coming next. Between these ages the diseases which previously have decimated children again and again, have lost their power, while the diseases which subsequently prove so fatal are seen just beginning. Enteric fever makes its appearance, causing 32 deaths, more than from any other one cause, and tuberculosis having ceased to attack so fre-

quently the abdominal viscera, first shows a serious disposition to transfer its attention to the lungs; 26 died of phthisis. Next to these two diseases come disease of the heart and scarlatina, which each caused 22 deaths. The total deaths between 10 and 15 were only 260, showing that this period is the healthiest of a man's whole existence.

Between 15 and 20 the total deaths were 332, 43 of them in December, the most unhealthy month for that age last year. Phthisis caused most deaths, 151, only 15 less than half of the whole number; next came enteric fever, 40; next disease of the heart, 34; and then pneumonia, 21.

Between 20 and 30 years the total deaths were 1408, 628 of them (again not far from half of the whole number) caused by phthisis, which at this period shows its full power. Enteric fever comes next, causing 119 deaths, this disease also showing its full power at this period. Pneumonia and disease of the heart follow, causing 52 and 51 deaths respectively.

Between 30 and 40 the deaths were 1251; in numbers a slight decrease, although relatively to the number alive at that period a slight increase over the preceding ten years. Phthisis pulmonalis caused 475; then came disease of the heart, 62; pneumonia, 57; and enteric fever, 44. This last disease after this diminishes in force while the two preceding go on increasing.

Between 40 and 50 the total mortality was 1020; from phthisis 289, not much more than a quarter of the whole; disease of the heart, 59, and pneumonia, 57; cancer comes next, 47. This last disease here first comes into prominence.

Between 50 and 60 the total mortality was 882; from phthisis, 163, less than one-fifth of the whole. Next come disease of the heart, 74; pneumonia, 61, and cancer, 59; precisely the same order as in the ten years preceding.

Between 60 and 70 the total mortality was 896; more actually, and of course far more proportionally, than in the former period. Phthisis here for the last time shows its pre-eminence, causing 103 deaths, less than one-eighth of the total mortality; it has thus reigned supreme from 15 to 70. Disease of the heart caused 73; pneumonia, 71, and cancer, 56 deaths, again the same order as before. Next to these come paralysis, causing 48, and apoplexy causing 47 deaths; the first time that these become very important. 85 deaths in this period are ascribed to debility—a rather uncertain term—and 8 to old age.

Between 70 and 80, 199 deaths are ascribed to old age, and only 4 to debility. These two names are evidently used to denote the same pathological condition, both indicating in most instances the fact that it has been not so much the severity of the disease as the weakness of the constitution—its being worn out, and unable to withstand even a slight attack—which has produced a fatal result. Still, of course, it is an imperfection to use such terms, and they serve only to cloak the ignorance of the writer of the certificate.

The total deaths between 70 and 80 were 742; a little more than half those between 20 and 30; but when considered in reference to the proportion between those alive at 20, and those alive at 70, three times as many. Paralysis caused 55, and apoplexy 32 deaths, together, 87. Disease of the heart caused 62, and pneumonia 49.

The total deaths between 80 and 90 were 402; 211 from old age; 40

from paralysis and apoplexy ; 15 from disease of the heart, and 15 from pneumonia.

Between 90 and 100 old age caused 55 of the 76 deaths, and between 100 and 110 all the deaths, 6 in number, are ascribed to the same cause.

The only epidemic which attained unusual proportions in 1869 was one of scarlatina. This is a disease which appears to have been gradually making progress in this city ; as, from 1807 to 1818 there were in all only 13 deaths ; from 1818 to 1830, 149 ; since then, a varying but persistent increase has taken place.

The greatest mortality from this cause was in the month of December, when there were 111 deaths. The disease had previously attained considerable prevalence in June, when there were 84 deaths, but it then declined, and in September there were only 40 deaths ; less than in any other month in the year ; after which it again rapidly and alarmingly increased in severity. The total mortality from scarlatina in 1869 was 799.

Enteric fever caused in 1869, 383 deaths, to 395 the year before. This disease has been gradually declining ever since 1865, when it caused 773, or nearly three times as many deaths as in the past year.

Typhus and the other low forms of fever, including cerebro-spinal meningitis and malignant fever, caused 88 deaths, hardly a tenth part of those they caused in 1864, since which time they have been gradually declining.

Rubeola caused 85 deaths only, also a diminution from the few preceding years. This disease caused 221 deaths in 1866.

There were in 1869, 50 deaths from the various malarial fevers ; here again we have a reduction as compared with the six preceding years. In 1864 there were 77 deaths reported as caused by congestive fever alone.

The deaths from variola in 1869 only amounted in the whole year to 6, 2 males and 4 females—the males being both between 30 and 40 years of age, and the females, all four, under 2 years. Even this small number, however, was an increase over the preceding year, when there was only a single death from this cause.

There were in 1869 no deaths from yellow fever, the only case reported to the Board of Health having died elsewhere and the body having been brought here for interment.

Nine cases of death from cholera were reported in 1869.

The total mortality from phthisis in 1869 was 1975, 20 less than in 1868 ; 982 were males and 993 females. In March most died from this cause, viz., 215 ; next, in the months immediately preceding and succeeding, viz., 187 in April and 185 in February. The least mortality was in September, viz., 123, and next in October, viz., 132. There is, however, no rule in reference to this, as, for example, in 1866, October, instead of being the month with nearly the least mortality, was that in which there was next to the greatest, January having the greatest ; and on going further back we find a year (1858) in which September (which eleven years later had the *least*) had the *greatest* mortality.

From diseases of the respiratory system (not including phthisis) there were 1296 deaths.

From diseases of the circulatory system, 587 ; a slight increase over the preceding year.

From diseases of the nervous system, 1985 ; a diminution from the preceding year, when 2124 died from this cause.

From diseases of the digestive system there were 2064 deaths.

The meteorological observations on which the present report is founded were taken by Dr. Conrad, at the Pennsylvania Hospital, and are entirely reliable.

The mean temperature of 1869 was 54.75 Fahr., 1.25 degrees above the mean of 45 years. The only months which were colder than usual were one of the spring (March), and two of the autumn (October and November). July varied less than any other from the average, only $\frac{1}{4}$ degree, while August was 2.70 above the average, making it nearly as warm as July. January varied most from the general average of the month, being 5.32 degrees above it; the warmest January except two in 45 years. February was 4.58 degrees above the average. November, on the other hand, was 3.25 degrees below the average, being the coldest November since 1848, and only 4 degrees warmer than December. The early part of March was very cold, the average until the 24th being below that of February.

The highest point which the thermometer reached in the year was 97.5, on July 16th. There were, accordingly, not many cases of sunstroke—only 12 in the year.

49.86 inches of rain fell in 1869, 4 inches more than the average—April, July, August, and September being the only months in which it was dryer than usual. August and the few weeks immediately preceding and succeeding were especially dry, causing great injury to the autumn crops.

On October 2 the rain fell in torrents all the afternoon and evening, and this was the case over the whole valley of the Schuylkill, so that the next day there was the greatest freshet ever known here, the water being $11\frac{1}{2}$ feet deep on the breast of the dam at Fairmount. The freshet extended from Maine to Virginia.

On the 1st of January, 1869, there was a storm of rain and sleet, and the ice formed so thickly on the trees that many branches were broken by the weight, and the roads in some places were obstructed.

On the 15th of April there was an aurora borealis, which has rarely, if ever, been paralleled here. Telegraphic despatches could be sent by the aid of it alone.

June 27th there was a tornado in the lower part of the city, which did a great deal of damage, even blowing down some houses.

On the 22d of October there was an earthquake in New Brunswick and Nova Scotia, severe enough to overthrow chimneys and do slight damage in other ways, and extending, in a less degree, to the neighbouring parts of the United States. Although it was not felt here, it may be mentioned as the one which has approached us more nearly than any other.

Some tables prepared to accompany this report are unavoidably omitted.

ART. XV.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1869. *Sept. 9. Anencephalic Fætus Born at Full Term.*—Dr. W. W. KEEN presented the specimen (which had been for some weeks in alcohol when it was examined) for Dr. WM. H. FINN. The neck, on dissection, showed everything in a perfectly normal condition, including the nerves. The vault of the cranium was entirely gone, the scalp being in direct contact with the base of the skull. No vestiges of the brain were present except some small, brownish-black, semi-solid masses of matter filling up the inequalities of the skull. Whether even this was nervous in character could not be recognized in the condition in which it was found. Some small distinct filaments, probably nervous, ran across the base of the skull to its foramina, and were connected posteriorly with the spinal cord, but they were so soft that they could not be dissected.

The spinal cord was normal. Where the medulla oblongata should be, however, it terminated in a ragged end of softened tissue. The base of the skull was rugged and uneven from irregular development, and the basilar process and surrounding parts were one large and almost perpendicular hill. The eyes were very large and prominent, but apparently perfectly developed. All other organs were normally developed, both in the thorax and abdomen.

September 23. Fibro-Nuclear and Cystic Growths, involving Ovaries and Peritoneum.—Dr. J. H. GROVE exhibited the specimen, and gave the following:—

Was called to see Mrs. M., aged 65, in February last. She had a tumour, giving her considerable discomfort, in the right iliac region, and encroaching upon the hypogastric region, measuring about four by five inches. In a few weeks it was noted that fluid was collecting in the abdominal cavity, and this continued to accumulate until the 4th of August, when her abdomen was much distended. Upon that day I tapped the abdomen, removing about five gallons of dark, highly albuminous liquid. At that time her lower extremities were œdematous, she was quite feeble, and considerably emaciated. The œdema almost entirely disappeared in a few days after the tapping.

After the removal of the liquid, the tumour appeared more distinct and irregular in form, while another hard mass was now detected above the first tumour. Both of these tumours could now be distinctly traced through the thin abdominal parietes.

In a few weeks, however, the liquid appeared to be again collecting quite rapidly, so that, on the 13th inst., I tapped her the second time, removing about three gallons of fluid presenting the same character as that removed by the first tapping. She died on the 16th inst., three days after the second tapping.

At the *autopsy*, I found in the abdominal cavity about three pints of liquid, similar to that removed by tapping. The pelvis was filled with an abnormal growth, completely enveloping the uterus and its appendages, the rectum and the bladder, and firmly adhering to the pelvic wall. Attached to this mass, and connected with the ovaries, were two multilocular ovarian cysts; the one on the right side being the larger.

The parietal peritoneum was quite livid and thickly covered by abnor-

mal growths, so as to be almost entirely transformed into diseased structure.

The visceral peritoneum was thickly studded by the same sort of abnormal formation. The covering of the stomach was less involved than any other part of the peritoneum; but near to the pylorus were a few of those masses.

The omentum was completely transformed into a large, indurated, diseased mass.

The mucous membrane of the alimentary canal was normal.

All the other viscera of the abdomen were healthy, excepting their peritoneal coverings.

The lungs were perfectly healthy, but had quite extensive pleuritic adhesions on both sides.

The heart was in a normal condition, excepting slight thickening of the mitral valves.

A hurried examination with the microscope showed the growth to be made up of fibres, through which were infiltrated a large number of free nuclei, with a few fusiform cells, corresponding with descriptions given by Bennett of his fibro-nuclear tumour.

Dr. TYSON stated that he had examined microscopically *solid* parts of these growths said to have been taken from the peritoneum and ovary, and found the following elements: 1st. An imperfect, somewhat granular fibrous stroma. 2d. Scattered throughout this, and floating freely, a cellular element, composed of uninuclear cells of moderate size, free nuclei, and of form representing every grade of oval, from those a little more than round to typical spindle cells. The round and oval cells range from $\frac{1}{2000}$ to the $\frac{1}{1000}$ of an inch in diameter, and were provided with small oval nuclei, approaching the size of a red blood corpuscle, and corresponding in character with the free nuclei, which were abundant. The cells and nuclei were granular throughout, the latter more markedly so, while a number of the former exhibited complete fatty degeneration. 3d. Free oil, in drops and granules.

The fluid of the cysts was not brought to me for examination.

Dr. W. PEPPER referred to a case of colloid cancer of the omentum, which he had exhibited before the Society at a meeting in June. The present specimen appeared to him somewhat analogous, inasmuch as it presented a combination of cystic formation, with solid growths. These were also combined in the two ways most frequently met with in cystic malignant disease. Thus the omentum presented the ordinary appearances of colloid disease, save that the cysts were unusually prominent and their contents very thin; whilst the large cysts, developed in connection with the ovaries, presented an indigenous formation of small, flat, sessile, epithelioma-like growths, which closely resembled the nodules observed upon the surface of the visceral and parietal peritoneum.

Dr. H. ALLEN suggested the possibility of such conditions as those present in this case being due to peritonitis occurring years before, since in such case the peritoneum may present nodules similar to those in the present case.

Dr. W. PEPPER, in reply, remarked that this supposition appeared highly improbable to him, since the nodules of organized lymph found on the peritoneum, as the result of inflammation, are usually smaller than those here seen. In addition to this, however, the resemblance between the peritoneal nodules and the indigenous growths found in the ovarian

cysts, and the condition of the omentum, seemed to preclude the idea that the morbid process had been one of simple chronic inflammation.

Oct. 14. Dr. WILLIAM PEPPER presented three specimens of *aneurism of the abdominal aorta*, two of which were seated just below the passage of that vessel through the diaphragm, the third being seated at the bifurcation of the aorta.

In each case marked erosion of the vertebral bodies had occurred, extending so deeply in one instance that the spinal canal had been opened: the intervertebral cartilages were comparatively much less destroyed.

The aneurisms were prepared as dry specimens by Jules Bailly.

Sacro-Iliac Disease, with Subsequent Occlusion of the Iliac Veins and Vena Cava. Dr. J. B. MUSTIN presented the specimens and read the following history:—

P. P., aged 25, was admitted to the Episcopal Hospital November 19, 1868, affected with what was apparently a psoas, or iliac abscess, which had opened in the left groin and was discharging freely. He was much reduced by the drain, which had existed some four months, and was confined to his bed from the time of his admission. Under the use of tonics and nourishing diet he rallied somewhat, but the discharge continued unabated. There was at first some difficulty in determining the exact seat of the disease, as neither the vertebra nor the hip-joint appeared to be diseased. A long probe, passed in at the opening in the groin, passed around the hip-joint, upon the dorsum of the ilium, and also under Poupart's ligament into the pelvis, but touched no diseased bone. The case was decided by the Attending Surgeon, Dr. John Ashhurst, Jr., to be a case of sacro-iliac disease. The pus showing a tendency to collect in the tissues of the hip, a counter opening was made over the trochanter for the freer evacuation, and another opening subsequently formed on the inside of the thigh. From these openings the pus continued to flow profusely, amounting at least to a pint daily for several months. The lower extremity on the affected side was from the time of his admission quite œdematous, showing that the circulation was seriously interfered with by the pressure of the abscess. This swelling continued to increase until the left leg was two or three times the size of the other, which was, however, quite emaciated. Livid ecchymotic spots appeared, from time to time, and the integuments threatened to slough, but did not to any great extent. The limb, however, continually exuded a watery fluid, which kept the bed constantly moist.

About the beginning of the month of March, the condition of the patient remaining otherwise much the same, the other leg commenced to swell, owing to obstructions of the circulation on that side. This œdema increased rapidly, until in a few weeks the right limb had obtained the size of the left, corresponding in its general condition with the description already given. This continued until a short time previous to death, which occurred on the 11th of July, when the leg sensibly decreased in size.

The strength of the patient held out remarkably, and the digestive functions were well performed. He had occasional attacks of diarrhœa, which yielded readily to treatment; was also troubled with chronic bronchitis, with abundant expectoration. Notwithstanding the large

quantities of food and stimulus which he consumed, he gradually emaciated, and died of exhaustion about eight months after admission.

The *post-mortem* examination revealed a large cavity, with a firm wall on the dorsum of the ileum, occupying the position of the glutei muscles, and another occupying the iliac fossa. These two main cavities were filled with pus and communicated with each other through the sacro-sciatic notch, and also in front. The point of suppuration was at the junction of the left ileum with the sacrum. Both these bones were found necrosed, but especially the sacrum, which was "honey-combed" for several inches. The apex of the bone is also carious from a bed-sore, which had existed over that point.

The great œdema of the lower extremity was fully accounted for. The iliac vessels on the left side were firmly imbedded in the pseudo-membranous walls of the iliac abscess. The artery did not appear diseased, but the vein was much shrivelled and contained a firm, fibrinous clot, adherent to the walls of the vessel, and entirely obliterating its cavity. This extended upwards along the cava as far as the renal veins, and was apparently projecting into these. Below the renal veins the vena cava is entirely occluded, and ends, as it were, in a *cul-de-sac*. The clot also extends downwards into the iliac veins of the right side. The origin of this disease of the vessels appears to have been at the seat of the abscess on the left side, from pressure at that point. For the œdema existed only on that side up to May, 1869, the clot gradually increasing, and at that date reached the cava, and the right iliac vein became thus secondarily involved.

Gunshot Wound of Neck; Paralysis of Left Upper Extremity; Probable Reflex Paralysis of both Lower Extremities; Partial Recovery; Death from Phthisis three years afterwards. HARRISON ALLEN, M. D., read the following history of this case:—

Capt. —, Penn. Cav., was wounded in a hotly contested action at Darbytown Road, Va., October 7th, 1864, by a conoidal pistol ball, which entered left side of neck, one inch above clavicle, a little to the outer side of sterno-cleido-mastoideus, and lodged. Capt. —, at the time, was mounted, and in the act of discharging a pistol at a confederate officer, from whom he received the wound. The position of the body, therefore, was upright, and, probably, inclined slightly forward. The exact distance between the combatants is unknown, but it was not great, for the forces were engaged in a hand-to-hand fight, and a simultaneous discharge of pistols between the officers was followed by a demand, each to the other, to surrender.

Immediately afterwards, Capt. — fell senseless from his horse, and remained in an unconscious state for four hours. Upon his recovery, it was discovered that paralysis of both lower extremities existed, while intense burning pain was experienced in palm of left hand. The precise duration of the paralysis is not known. It improved, however, some time prior to November 24th, 1864 (seventh week), the date of his transfer from general hospital, at Fortress Monroe, to the Officers' Hospital, at Philadelphia.

At this time the right leg enjoyed a slight degree of motion, which, by December 1st (eighth week), had increased. This was also the case with the left leg, but to a less degree. The arm remained useless and painful. As far as could be learned, the recovery of sensation preceded

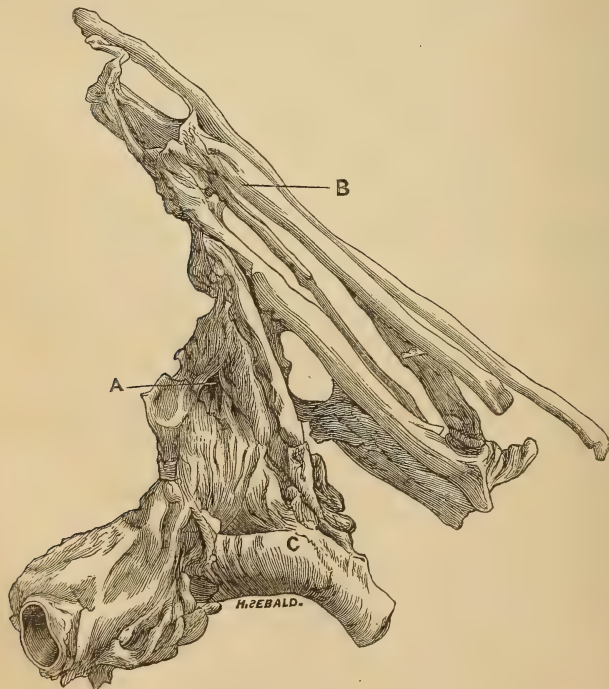
that of motion. By April 1st, 1865 (fifth month), Capt. — could walk with crutches, and by May 4th had recovered sufficiently to permit him to return to his regiment. The burning pain in hand persisted, however, until August, 1865 (tenth month), when it became more endurable, but did not disappear until some time later. At the last-mentioned date he was mustered out of service.

His condition at this time was as follows: Recovery of right side of body, excepting foot, which could not be extended completely, and was sensitive to moderate degrees of cold. Recovery of motion in left lower extremity, excepting power of extension, which was impaired. In act of walking, the limb was swung outwards and forwards by a peculiar motion, probably chiefly accomplished by the abductor and rotator muscles at hip. Sensation remained obtunded.

In the left upper extremity the motion had been restored, except in the extensors and flexors of the hand. The fingers were rigid and permanently semi-flexed. The palmar pain had almost entirely disappeared, but general sensibility was diminished. The nutrition of the member was very deficient.

Capt. — remained in this condition until November, 1866 (thirteenth month). He was able to walk distances of several squares at a time,

Fig. 1.



A. Position of particle of lead; B. Brachial plexus of nerves; C. Subclavian artery.

and to attend to the duties of his occupation as clerk. In the latter part of November symptoms of phthisis set in. A severe attack of hæmop-

tysis occurred in December, and from this time the disease advanced (presenting, so far as was learned, no peculiar characters), to terminate fatally October 25th, 1867, about three years from date of reception of wound.

Autopsy.—Four days after death, body in ice. Emaciation extreme; left arm as described in last note; it was of a marble whiteness; the motions of joints perfect, excepting the fingers, which were fixedly semi-flexed.

The cicatrix on neck depressed—not puckered—about the size of a split pea, and was non-adherent.

No clue was furnished as to the position of the ball. A careful dissection of the neck appeared to be the only method by which the missile could be found. The results of this examination yielded:—

1. An irregular particle of lead (Fig. 1), about the size of a mustard seed, imbedded in the connective tissue, between the brachial plexus of nerves of the left side and the corresponding subclavian artery.

2. Numerous minute, irregular particles of lead, measuring from a millimetre to half a millimetre in diameter, disseminated through the spinous process and laminae of the first dorsal vertebra. These curiously situated granules were most conspicuous upon the inner aspect of the parts in question.

3. The ball, lodged deeply in the *right* side of the posterior cervical region (Fig. 2). It was found lying on the side of the spinous process of the second dorsal vertebra, near its tip. It was inclosed in a well-defined capsule, which was intimately associated with the spinous process above by means of a conspicuous exostosis. The ball was of lead, conoidal, and measured thirteen mill. long by nine wide. There was nothing in the form of the ball to warrant the supposition that it was of an explosive character. The spinal cord was congested. The perimembranous fluid was gelatiniform and of a decided pinkish hue. The cord was submitted to Dr. S. Weir Mitchell for examination, who pronounced it free from lesion.

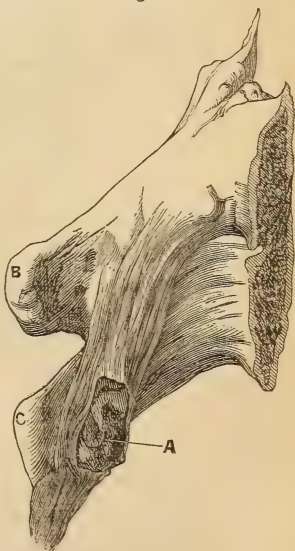
Remarks.—The case is interesting, it is thought, from the following circumstances:—

1. That it is, so far as is known, the only case on record in which the course of a wound, inducing reflex paralysis, has been traced by dissection.¹

2. That conspicuous change had taken place in and about the membranes of the cord, although there was no proof that the ball had entered the canal.

3. That the position of the ball, on right side of vertebral column, without apparent fracture of intervening bones,

Fig. 2.



A. Ball; B. First dorsal spine;
C. Second dorsal spine.

¹ See the well-known Memoir on Gunshot Wounds of Nerves, by Mitchell, Morehouse, and Keen; also, a later contribution, by S. Weir Mitchell, M. D., entitled "Paralysis from Peripheral Irritation."—*N. Y. Med. Jour.*, 1866.

as well as the presence of particles of lead in the first dorsal spine, are curious and unique.

4. That it does not follow that upon the extraction of a simple conoidal ball we have removed from the body all the lead which entered it.

Oct. 10. Cystic Disease of Kidney, with Ulcer of the Stomach.—Dr. MUSTIN presented the specimens for Dr. C. B. NANCREDE, who furnished the history:—

J. S., æt. 59, admitted July 30, 1869. On admission complained of pain in the region of left kidney, increased by motion or pressure, which he had been suffering from for about ten days, with great emaciation. Before admission urine had been scanty, high coloured, and apparently, from his account, bloody. When examined after admission it appeared normal though still scanty, neither albumen nor casts being discoverable. Under use of diuretics it resumed its normal amount and appearance. There was great hyperæsthesia of abdominal parietes. During greater portion of day but little fever, increasing however towards evening, for the first month, afterwards not perceptible.

During the first week of August diarrhoea and vomiting commenced, and continued with varying intensity until death took place. No permanent effects could be produced by medicines on these discharges, especially towards the last, when they were perfectly uncontrollable. He also had a short, spasmodic cough with but little expectoration. The abdominal pain during the first few weeks was intense, but abated in part under the use of large doses of opium.

When admitted, he had in addition to the above-mentioned symptoms, a singular universal tremulousness, and later in the disease had several well-marked hysterical convulsions. On the access of the vomiting, or shortly after, an almost gangrenous odour of the breath was perceived, at first entirely removable by the use of creasote, latterly only in part. On careful examination on many occasions no disease of the lungs or throat could be discovered to account for it. Three days before death the pain in the lower portion of the thorax increased, and he died in a typhoid state seventy-three days after admission.

Sec tio cadaveris sixteen hours after death.—On opening the abdominal cavity no signs of disease were immediately apparent; but on examining the region of left kidney, it was apparently absent. On examining further, however, a fluctuating tumour was found which proved to be the kidney distended by fluid. It was firmly bound down to the surrounding parts. The other kidney was easily removed, was firm and much congested. Stomach was also removed, and presented several congested spots apparently eroded. The heart was natural; right lung bound down by moderately recent adhesions; bladder rather small.

On examining the left kidney microscopically, both pyramidal and cortical portions were found much atrophied and fatty, with the pelvis largely distended and stricture of the ureter.

Dr. TYSON desired to know whether a microscopic examination had been made of the condition of the capillaries of the stomach. In a stomach which was the seat of hemorrhagic erosion and ulceration, exhibited by him in June of this year, and which accompanied fatty and contracting kidneys, the bloodvessels of the stomach were the seat of granular degeneration. In the case now reported the renal disease was plainly the result of obstruction, and is accompanied as well by hemorrhagic erosion

and ulceration of the stomach. If now a granular change of the blood-vessels of the stomach be found to exist, it will be evidence, if any relation exist between the condition of the kidneys and that of the stomach, that the former is causative, and that the condition of the latter and the symptoms arising therefrom are the result of an effort at substitutive elimination; whereas, in Dr. Tyson's case, although such an inference is possible, yet it is equally possible to infer a general cause operating to produce both effects. A single instance, however, like this one of obstructive disease, will go further than a large number where there is no way to determine the exact seat of the primary lesions; a minute examination of the stomach becomes therefore of great importance.

On motion a committee was appointed to make such examination. The chair appointed Dr. Tyson and Dr. Mustin, who submitted the following—

Report.—The committee appointed to make a microscopic examination of the vessels of the stomach which accompanied the specimen of cystic kidney presented October 14, and which appears the seat of ulceration and hemorrhagic erosion, report that they find these capillaries the seat of a granular and fatty degeneration beyond a degree which could have resulted from maceration. The gastric tubules, also, exhibited advanced fatty change, being in places packed with oil globules of considerable size, while their proper lining cells had disappeared.

Oct. 28. Rupture of Liver. Death on tenth day from Internal Hemorrhage—Dr. HUNTER exhibited specimens and read the following history:—

James Murphy, æt. 26, seaman, admitted to Pennsylvania Hospital October 3, 1869, for injuries received by jumping from a third story window while in a partially intoxicated condition. On admission presented marked symptoms of shock; there were no external wounds, nor could I detect any fracture. Patient complained of great tenderness and intense pain in right hypochondriac region when first admitted, nor was he entirely free from them till he died. Had repeated attacks of vomiting nearly every day, which were not controlled by the usual remedies. The vomit consisted principally of ingesta and bilious matter, but on the third and fourth days clots of blood were discovered in the matters vomited. The stools, likewise, on these days, contained small masses of blood. The countenance at all times was anxious, and he complained of severe pain in region of liver. The treatment consisted of perfect rest, morphia in large doses, and counter-irritants to right hypochondriac region. Died on the 13th.

Autopsy, nine hours after death, confined to chest and abdomen. The body was much emaciated, and its surface decidedly jaundiced. Found no lesions in thorax. On opening the abdomen I found the peritoneal sac filled with a bloody fluid. There were several large clots of blood clinging to the liver, in truth almost completely enveloping that organ. When these clots had been removed, an extensive rupture of the right border involving the entire thickness of the liver, and to a depth from the thick edge of one and a half inches on upper, and nearly two and a half inches on under surface, was discovered. The liver in the vicinity of the laceration was connected to the diaphragm by bands of recently organized lymph. Decided efforts towards a spontaneous cure appear to have been made, as quite a portion of the lacerated hepatic tissue had become united by the fibrin of the extravasated blood. The gall bladder

and its duct had escaped injury. I was unable by a superficial examination, to find any lesions of the coats of the stomach or intestines, save two or three ecchymosed patches. The other abdominal viscera appeared normal. There were no evidences whatever of general peritonitis, as the peritoneum everywhere, except around the liver, presented its characteristic polished surface.

Dr. WILLIAM PEPPER exhibited a *femur which on section presented necrosis* of the middle two-thirds of the original compact shaft. The cancellated tissue of the shaft had retained its vitality and its connection with the cancellated tissue of the articular extremities, and then had an enormous production of compact bone upon the exterior of the original shaft, which thus formed a cylinder of white necrosed bone, entirely unattached but imbedded between the cancellated tissue within and the new-formed compact tissue externally. The exterior of the bone was roughened and nodulated, and presented two small fistulous tracks communicating with the tubular sequestrum above described. No history could be obtained of the case from which the specimen was derived.

Fatal Hemorrhage from the Liver in an Infant.—Dr. HODGE was recently called upon to make a post-mortem examination of a baby two and a half days old, considered by its attending physicians and parents to have been perfectly healthy until its sudden death. The abdominal cavity was found filled with blood partly fluid and partly coagulated. Its source was finally traced to the liver, of which the peritoneum covering part of the inferior and part of superior surface of right lobe had been dissected up by the effused blood. No other lesion was found.

Dr. William Pepper suggested that the hemorrhage in this case might have occurred from the rupture of the peritoneum covering a large growth of cavernous tissue. This peculiar formation which, as described by Rokitsky, is especially common in the peripheral portions of the liver, presents on section a tissue like that of the corpora cavernosa, consisting of cells filled with fluid dark blood. There is usually a connection with some large portal vessel, and from the superficial position of the growth, a rupture might readily occur and be followed by profuse hemorrhage.

Nov. 11. Dr. HARLAN showed a small piece of cancellated bone, about an eighth of an inch in diameter, which had been expectorated from the lungs of a little girl, at the Children's Hospital, twelve years of age. "The patient is the subject of spine disease, from which she has been suffering for four years. There is very great deformity—posterior curvature—involving the dorsal vertebræ from the 6th to the 10th, inclusive. There is no history of the case beyond the very imperfect one that can be derived from the child's own account of herself. She states that for the last two years she has had more or less cough and expectoration. She has now occasional, but not violent, cough, and abundant expectoration of nearly pure pus. Careful physical examination reveals no decided sign of tubercular deposit, or other disease of the lungs sufficient to account for the amount of expectoration. On suggesting to the assistant physician the possibility that the pus might come from an abscess connected with the vertebræ, I was informed that a piece of bone had been found in the sputa. The other day this piece—much smaller than the first—was expectorated. The child states that it gave a good deal of pain in its passage, and left 'a scratching feeling in the wind-pipe, as if

there was something sharp in there still.' It has not been examined microscopically, but I think there is scarcely any doubt of its nature."

Dr. W. W. KEEN recalled a case published in the work on *Gunshot Wounds and Other Injuries of Nerves*, by Drs. Mitchell, Morehouse, and himself, in which a sharpshooter received a ball which, removing two teeth and ploughing up the tongue, lodged in the third cervical vertebra. Later, some seventeen pieces of bone were discharged from the body of the vertebra, and one-half of the wall of the vertebral foramen; yet the man recovered so completely that he re-enlisted in the Volunteer Reserve Corps.

Dr. ASHHURST referred to cases reported by Wade, Keate, and Mercogliano, in which large portions of vertebræ had come away through the mouth. In the cases recorded by the first two writers, considerable portions of the atlas had exfoliated. He suggested that the specimen should be examined microscopically, in order to ascertain if it were really, as it appeared to be, composed of bone. In accordance with this suggestion, the specimen was referred to a committee, consisting of Drs. Hargadine, Keen, and Mustin.

Report.—The committee appointed to examine microscopically the specimen of supposed bone, expectorated by Dr. Harlan's patient, report that they unhesitatingly pronounce it to be bone tissue, the canaliculi, lacunæ, and Haversian canals being discernible. The specimen has the appearance of having undergone long maceration, the organic constituents being in great part removed.

Examination of Persons who had been Hung.—Dr. KEEN had an opportunity of examining the bodies of two criminals who had been hanged and had fallen about five feet. In one, the hyoid bone was fractured, but in neither case was there fracture of the vertebræ. As the spinous process of the atlas is wanting, while that of the axis is well developed, there is between the occipital and the spinous process of the axis a marked depression, filled out by the soft parts.

Unless the existence of this depression is borne in mind, we may be easily led to an incorrect diagnosis of displacement of the atlas either by fracture or dislocation.

Hydrancephalocoele.—Dr. WILLIAM PEPPER presented a specimen of this, preserved as a dry preparation of the entire skeleton. The birth occurred in the lying-in ward of the Philadelphia Hospital, under the care of Dr. Duer. The child was stillborn, after a tedious labour caused by the difficulty of inducing the head to engage at the superior strait.

The child presented a sac hanging from the occipital region, fully four inches in diameter. On opening this, the dura mater and arachnoid were found to invest its inner surface. The cavity of the sac communicated with the cranial cavity by an abnormal opening in the occipital bone three-quarters of an inch in diameter, seated a short distance above the foramen magnum. The brain was partly contained within the cranium, but in part lay outside of the cranial cavity in the abnormal sac above described.

There was no other anomaly whatever about the skeleton.

Degenerated and Atrophied Hydatid Cyst in the Liver.—Dr. MUSTIN exhibited the specimen for Dr. NANCREDE, and made the following remarks:—

The specimen presented was taken from the body of a man who died in No. CXVIII.—APRIL 1870.

the medical ward of the Episcopal Hospital ; a yellow cicatricial spot was noticed on the upper surface of the right lobe of the liver about as large as a silver dollar. On cutting through this, a cyst somewhat larger than a walnut was found, with a fibrous wall in some places cretaceous, containing a yellow gelatinous substance of the consistence of calves' foot jelly ; this was divided into segments resembling sections of an orange, and the interstices filled with a cretaceous substance. On chemical examination this proved to be composed of alkaline carbonates, with a fatty matter soluble in ether ; under the microscope it presented granular amorphous matter, plates of cholesterin, and oil globules. In the gelatinous substance were found numbers of the characteristic hooklets of the echinococcus ; some of which were also noticed in the cretaceous portion. The only other appearances seen in the fluid were granular matter, fat, oil globules, and crystals of cholesterin. No complete echinococci were found, and no free fluid. The cyst had evidently become much atrophied. The liver was not distorted in shape. No similar formations were found in other portions of the body. The man had taken corrosive sublimate with suicidal intent, and was admitted to the hospital under an assumed name, so that nothing is known of his previous history, or of the symptoms which this disease may have at any time produced.

Blood Tumour.—Dr. D. H. AGNEW exhibited the specimen, and gave the following account of the case :—

Stephen G. G——, male, æt. 23, by occupation a farmer, presented himself at the clinic of the University of Pennsylvania, October 23, 1869, with a tumour occupying Scarpa's triangle. It was elastic to the touch, with a very indistinct sense of fluctuation, measuring about four and a half inches by three inches, and ovoidal in form. When firmly pressed upon, some movement could be detected, but only when thus pressed. No sound however, could be heard. Its size was not influenced in any way, either by pressure on the femoral artery above or below. The tumour could be moved or partially displaced from its bed. He represented himself as being exceedingly fond of jumping, leaping at one time the distance of twenty-seven feet—this I think would admit of some subtraction. It was after a feat of this kind, twenty-two months before his admission, that he discovered a swelling the size of a hickory-nut in the groin, unattended with pain or any unusual discomfort. Its growth from that period until his admission into the hospital ward of the College has been steady, and produced then some uneasiness, a tired or weary feeling in the limb. The introduction of the exploring needle disclosed the presence of blood, which materially reduced the size of the tumour as it flowed along the groove of the instrument. On the withdrawal of the needle the tumour soon became tense and full. Its nature was decided to be a cyst containing blood, either formed from the femoral or saphena veins.

I removed it at the clinic of the College. In detaching it from its surrounding connections, it was found to have produced the absorption of a portion of the fascia lata, uncovering thereby the sartorius, and lying directly over the femoral vessels ; but on its inner and under aspect, a vein was found, doubtless the saphena, leading into the growth, which was tied before detaching. When the sac was laid open, the continuation of this vessel was found in its interior with several tributary branches, also a quantity of coagulated blood, with much that was fluid. The wall would

seem to be formed of the surrounding cellular tissue, adherent to the vein just without the opening in its walls.

Dr. ASHHURST commented upon the symptom mentioned by Dr. Agnew, that this tumour had always exhibited fluctuation, which would render it probable that the contained blood had remained in a fluid condition from the time of its effusion. He referred to the views of Mr. Baker [*St. Bartholomew's Hospital Reports*, vol. i. pp. 201-223], that the fluid blood contained in tumours was usually the result of disintegration of a previously formed coagulum, rather than normal blood in an uncoagulated state, and also referred to a specimen of mammary tumour, which he had himself exhibited to the Society [*Am. Journal of Medical Sciences*, April, 1864, p. 430], in which were two cysts containing fluid blood, the origin of the disease in that case, as in Dr. Agnew's, having been traced to a traumatic cause.

Dr. W. PEPPER said the remarks of Dr. Ashhurst suggested two cases, illustrative of the condition referred to, and one of which was interesting from its rarity. The first was a cyst removed by Dr. Agnew at the Pennsylvania Hospital, from over the spine of the scapula of a little boy. It had a very dense wall, and on being opened was found to contain fluid blood. Microscopically it appeared to contain no white corpuscles, but a full proportion of red corpuscles fully formed. The interior of the cyst presented a serous aspect.

The second case was that of a boy who fell, and was struck by a cart in the right side of the abdomen; the injury was very quickly followed by marked enlargement of the abdomen, which fluctuated distinctly on palpation. It was at first supposed to be a case of ascites, but the swelling was not perfectly symmetrical. After numerous efforts at evacuant treatment, a puncture was made, and a number of quarts of transparent light yellow fluid of low specific gravity were withdrawn, containing a little chloride of sodium, and leaving a little residuum after evaporation. Towards the close, the discharge began to grow turbid and bloody. There was marked diminution in the size of the abdomen, but on palpation there was found a solid mass remaining. The fluid again accumulated and was again drawn off, leaving an indurated mass of crescentic shape, extending from the right of the epigastrium down far into the abdomen. The most plausible explanation appeared to be, that there had been a large effusion of blood which had become circumscribed, and that a complete separation of the serum from the fibrin and corpuscles had taken place. The former was drawn off, leaving the latter remaining as a coagulum. The fluid again formed by breaking down of the clot, and was again drawn off. The large mass remained in the abdomen, but the boy appeared in good health. We have here, probably, a case of the kind mentioned by Mr. Baker, as most common.

ART. XVI.—*Proceedings of the Clinico-Pathological Society of Washington, D. C.*

1868. Nov. 12. *Hæmatemesis*.—Dr. A. F. A. KING reported the following case:—

A widow, æt. 35; mother of several children; once aborted; has always had flooding after delivery; and has for years been the victim of dyspepsia.

About two weeks previous to the present attack, the menses had appeared and were more than usually plentiful. From accidental exposure to damp weather, they, however, ceased in twenty-four hours from the commencement, but no ill consequences were experienced at the time. The customary duration of her menstrual periods had been four or five days.

February 10th, while suffering from flatulence, constipation, loss of appetite, and gastric pain, she took before going to bed, on the recommendation of an old nurse, a large dose of a strong infusion of the eupatorium perfoliatum. Near midnight she awoke with nausea and faintness, and vomited a large quantity (*stated to be one or two pints*) of a dark, thick fluid, mixed with articles of food and drink. Unaware that the ejected matters contained blood, she was not alarmed, but rested comfortably during the remainder of the night.

The next morning, Feb. 11th, though feeling languid, and without appetite, she was sufficiently well to visit a sick relative in the neighbourhood, but was suddenly taken ill about noon, with nausea, vomiting of blood, and syncope. I first saw her immediately after this attack. There was great prostration, cold extremities, a barely perceptible pulse, and pallor of face. The quantity of blood ejected could not be ascertained; a large portion of it having soaked into the clothing. Ordered perfect rest in the recumbent posture; hot bricks to the feet; cracked ice internally; and gallic acid gr. v, with opium gr. $\frac{1}{4}$ every two hours. The first powder was rejected, the succeeding ones retained. Four hours after the attack she was driven home and remained pretty well during the following night.

12th, 10 A. M. Quite comfortable, except that she complained of some pain on the left side of the epigastric region. The bowels not having been open, she was ordered calomel and rhubarb āā gr. v, to be followed, if necessary, by ℥ss of castor oil. The diet to consist of cold liquid nourishment; and all stimulants to be abstained from.

Three-quarters of an hour after taking the medicine, nausea and faintness again came on, and she vomited nearly two pints of a dark coloured liquid consisting of blood and mucus. The laxative operated very efficiently during the afternoon; evacuations black. For several hours subsequently the nausea and death-like prostration were extremely distressing; the pulse was feeble, and attempts to rise from the horizontal posture occasioned syncope. In retching violently the blood vomited would occasionally be of an arterial hue, and so mixed with air bubbles as to resemble the frothy sputa of pulmonary hemorrhage; but there was no cough or physical signs of pulmonary derangement. Ordered acid. sulph. aromat. gr. xx, morph. sulph. gr. $\frac{1}{6}$, aq. rosæ f ℥ss, every two hours until sleeping. Cracked ice; perfect quietude, and sinapisms to epigastrium.

In two hours she vomited a full pint of pure blood, in coagulated clots, and unaltered by the gastric secretions. The syncope and prostration

were, however, not materially increased, and the distressing nausea and feeling of "sea-sickness," as she expressed it, had left her. The latter symptoms had probably been kept up by the presence of coagulated blood in the stomach. Applied heat and sinapisms to extremities. Ice and frozen tea internally. Continue acid morphia mixture. She rested at intervals during the night, but had no sound sleep on account of extreme thirst, which we feared to gratify lest the accumulation of liquid in the stomach should provoke vomiting and a recurrence of the bleeding.

13th, 11 A. M. No return of hemorrhage. Slight pain in epigastrium. Bowels not open. R.—Ol. ricini ℥ss, ol. terebinth. ℥ij.—M. To be administered *per ano.* Continue mixture. It was necessary to administer a second enema of soap and water, after which dark-coloured evacuations were produced. She now complains much of flatulence and pain near the umbilicus. R.—Aq. cinnamomi ℥iss, spts. lavand. co. ℥ij, tinct. cardam. co. ℥ij —M. Sig.—Teaspoonful occasionally, with directions to discontinue if it cause pain or nausea. During the evening she was annoyed with continual eructations; and the old distress of nausea and sea-sickness, but there was no faintness or failure of the pulse to indicate hemorrhage. Ordered lime-water and milk—the acid mixture having, of course, been suspended. Rising from her bed to evacuate the bowels at 8 P. M., another half pint of coagulated clots was ejected. In my absence, Dr. J. T. Young was sent for, and prescribed liq. ferri persulphatis gtt. x, diluted with a suitable quantity of water, which dose was, I think, repeated. But the bleeding still continuing, she took gtt. xx, which was soon rejected and followed by severe retching, a few coagulated shreds of black blood only being thrown off. Half drachm doses of liq. morph. sulph. repeated every hour, failing to relieve the nausea and retching, ten drop doses of ol. terebinth., taken on sugar, afforded immediate relief. She remained quiet during the remainder of the night.

15th. The nausea, vomiting, and hemorrhage have not returned. Suffers from violent neuralgic pains in head and face—the consequence of anæmia. Fearing to give even liquid food by the mouth, she was nourished with injections of beef-tea containing a little tinct. opii.

16th. Gastric symptoms have not returned; but on pressing ever so gently upon the epigastrium violent retching and attempts to vomit are immediately produced, but subside as soon as the pressure is removed. An enema of soap and water brought a dark-coloured evacuation, with an abundant discharge of flatus. She can now retain ices and iced milk.

During the next few days the stomach gradually regained its tone, so as to bear eggs, oysters, &c. For the anæmia she took tr. ferri chlorid. gtt. xx, ter in die; and also a pill before each meal containing two grs. each of quinia and rhubarb. The bowels kept open by enemata. Pressure upon the stomach continued to bring on retching and vomiting until the application of a small blister, when the condition was relieved.

On visiting the patient several months after the attack, I was informed that the next succeeding menstrual period had passed without the appearance of the catamenia. She afterward became regular every month, but was in the habit of spitting up a few mouthfuls of blood on the first day or two of each menstrual epoch. But this symptom finally subsided spontaneously, and the patient recovered her usual health.

The case is of interest on account of the *large quantity* of blood lost; and also in consideration of the fact that there was *no recurrence* of the

bleeding after the attack during which the *persulphate of iron* was administered.

December 17. Obstruction of Bowels in an Infant.—Dr. D. W. PRENTISS reported the following case:—

A. L., aged four and a half months; a fine, healthy boy, large for his age; has always been subject to attacks of abdominal pain; parents healthy.

The present sickness began suddenly October 8, 1867, with vomiting and violent screaming, as from intense pain. When called, two hours later, found the child much exhausted; pulse feeble and frequent; face pallid and shrunken, as in collapse, with livid lines around eyes and mouth; pain not so severe as at the onset, but the distressed look and restless movements indicated that it was still present. Dover's powder and calomel were ordered, to be followed by a dose of sweet oil; the latter not operating in the course of three hours, a teaspoonful of castor oil was administered.

October 8. No change; general condition same, but more prostrated; pain violent in paroxysms; frequent retching and bilious vomiting. Enema of warm water ordered; also, Dover's powd. gr. $\frac{1}{4}$, calomel gr. $\frac{1}{2}$, every two hours. *Afternoon.* Still no movement of bowels; pain somewhat subdued by opiate. Administered a large enema of warm "soapsuds," using a Davidson syringe and an elastic bougie, passing the bougie as far up into the bowels as the sigmoid flexure. The enema was, however, not retained, passing out again by the side of the bougie in spite of all efforts to prevent it. The injection was immediately followed by a discharge of mucus, tinged with blood, but no fecal matter.

9th. Early in the morning had two free passages of pure blood, unmixed with fecal matter. Very much prostrated; pulse feeble; face more pinched in expression than previously; pain under control of opiate. Still occasional retching, but no vomiting. Examined abdomen with the hand thoroughly; no soreness whatever under pressure; no tumour could be felt. Treatment continued. Fomentations of warm water to be kept constantly on the abdomen; wine and beef essence to support strength. *Afternoon.* Still the same, excepting weaker.

10th. No change for the better. No further hemorrhage. Made an unsuccessful attempt to inflate the bowels with air. Treatment continued.

11th. Early in the morning had a large fecal discharge from the bowels, tinged with blood. No improvement in general symptoms. Patient quiet without pain.

12th. Still growing weaker.

13th. Another large fecal discharge during night, but no amelioration of symptoms.

14th. Failing rapidly; muscular twitchings of fingers and mouth.

15th. Death quietly, without convulsions.

Autopsy twelve hours after death.—Form plump and full; no emaciation; no change externally, excepting discoloration of back of the neck and shoulders from stasis of blood. Abdominal cavity opened; half inch of fat found between skin and layer of abdominal muscles. Peritoneum healthy in appearance, as also intestines themselves, except in the region of the ilio-cæcal valve; no adhesions to walls of the abdomen, nor any bands constricting the bowels. At the ilio-cæcal valve the lower portion of the ileum for about six inches above the valve

was discoloured by dark, greenish blotches, which appearance was also noticeable in the colour for a few inches below the valve. On opening the bowel, dark, red spots on the mucous membrane, corresponding to these discolorations. The membrane itself was thickened and softened, showing a high degree of inflammation, verging into gangrene. A section of one of these spots exhibited, first, the thickened, softened mucous membrane; then an effusion of coagulated blood; next the muscular layer, and finally the peritoneum—both the latter of a greenish-purple colour. The ileo-cæcal valve was patulous, and appeared healthy. There was no intussusception nor twisting of the bowel to be noticed; nor were any bands of lymph found, such as sometimes cause concealed hernia. The ileum, however, was dilated to more than its natural calibre, while the colon just below the valve seemed contracted. The vermiform appendix was normal, and free from foreign body. No further examination of the cadaver was made.

The history of the above case indicates that there was an obstruction in the bowels at that point where obstruction most frequently occurs in children, viz., the ileo-cæcal valve; and that this obstruction was relieved either spontaneously or by the sedative and antiphlogistic treatment employed upon the fifth day of the attack. It is interesting to notice, however, that although the obstruction was removed at the time of the free fecal evacuations—as the autopsy subsequently proved—still there was no improvement in the symptoms; but the little patient continued to sink until death closed the scene upon the eighth day.

It would have been natural to have expected an abatement of the grave symptoms after a free motion of the bowels; but the fact in this case appears to have been that the obstruction gave rise to a local inflammation in the intestines, which had proceeded to a fatal degree before the exciting cause was removed.

The specimen presented does not solve the question as to what was the exact nature of the obstruction; but it is narrowed down to one of three conditions: either, first, a foreign body, or impacted feces acting as such; or, second, a twisting of the intestine; or, third, an intussusception. That it was not the first of these, I am satisfied; because in the movements of the bowels neither scybala nor foreign substance were found, and there was no abdominal tumour. As to the existence of the second or third condition, it is left to the Society to determine.

1869. February 11. *Extensive Ossification of Ascending Aorta, forming a nearly complete Bony Cast of the Vessel, and entirely closing the left Coronary Artery.*—Dr. J. FORD THOMPSON presented a specimen, with the following brief history of the case:—

W. M., æt. 29, soldier, admitted to Providence Hospital January 6, 1869. Had anasarca, and suffered with intense dyspnœa; pulse frequent and feeble. He was unable to lie down, and the difficulty of respiration was truly distressing. Aortic valvular disease was at once diagnosed by the attending and house physicians, with effusion into pericardium.

His previous history developed that he had had several attacks of rheumatism, the last of which occurred early the previous summer. He first became conscious of heart trouble in August, 1868, by frequent attacks of palpitation and shortness of breath. In September he was examined by the surgeon of the post (Fort Washington), and the disease recognized. About the same time, swelling of the lower

extremities made its appearance. He was placed in the hospital at the fort, where he remained until the day of his admission to Providence Hospital. Could learn nothing of the treatment, but he had been growing worse very rapidly, and was sent to the city for more comfortable quarters.

When admitted, digitalis, squills, and calomel were ordered; only a few doses of which, however, were taken, when he was put upon acetate of potash and stimulants, the latter treatment being continued until his death, which took place January 9, the third day after admission.

Autopsy January 10.—Thoracic viscera only examined. Large amount of serum in right pleura, but no evidence of inflammation. Lungs healthy; considerable effusion into pericardium.

Description of Specimen.—Heart nearly twice its natural size; both ventricles and auricles much dilated, the left ventricle in particular; mitral valve natural; aortic valves ossified at the tips, but much less diseased than was expected.

The ossification beyond the valves extends about two and a half inches along the ascending aorta, and forms nearly a complete lining to the vessel, *entirely closing the left coronary artery.*

Dr. Thompson considered the fact of the closure of the coronary artery to be of especial interest, as in his opinion it was the immediate cause of death, and of the very distressing symptoms constantly experienced. This closure must have occurred late in the disease, otherwise there would have been atrophy of the organ, instead of hypertrophy—that is, if it were possible for the heart to perform its functions for a sufficient length of time under such circumstances to allow this change to take place.

Three Cases of Injury to Cranium (two with fracture). Recovery in all.
Dr. A. F. A. KING reported the following:—

CASE I. September 15, 1865, a little girl, seven years old, was kicked on the forehead by a horse, producing a compound fracture of the skull, situate above the right frontal eminence near the sagittal suture. The pulse, respiration, general sensation, mental and motor functions, as well as the condition of the pupils, seemed to be unimpaired. Deciding to operate on the case immediately—for depression of the bone was visible—I obtained the assistance and advice of Drs. James Phillips and W. W. Johnston, and proceeded to remove the depressed bone, three hours after the accident. The patient was now in convulsions. Chloroform administered. After incising the scalp, it was found necessary to apply the trephine. The broken fragments removed, when put together, form an irregular heart-shaped piece, measuring one and a half inches in its transverse diameter, and one inch from base to apex. A small lappet of dura mater was turned up during the operation, but carefully smoothed down in place before closing the wound, which was done by sutures of silk.

On recovering from the anæsthetic, the patient conversed cheerfully, and seemed perfectly comfortable. No return of convulsions.

The subsequent treatment consisted in the *uninterrupted* application of ice to the wound, saline purgatives daily in small quantity, together with perfect rest, a vegetable diet and the exclusion of light.

At the end of two weeks the patient was sitting up in bed, and gradually took more and more exercise until recovery was complete. It is now

(1870) five years since the accident. The girl is well-grown and has good use of all her mental faculties. The pulsations of the brain at the seat of injury are very perceptible to the sight and touch; the opening in the bone, however, gradually grows smaller. The successful termination of the case is, I think, chiefly to be ascribed to the operation having been performed *soon after the injury and without waiting for symptoms of compression*; though the kind of after-treatment and the constancy with which it was employed doubtless had their good effect.

CASE II. On October 16, 1868, T. K., a student at the Maryland Agricultural College, fell over the balustrade, a distance of about fifty feet, to the brick pavement of the cellar below. On examination by Professor Higgins and Dr. Wells, they found that no bones of the trunk or extremities were broken, the brunt of the fall having been sustained by the head. The boy remained in a semi-comatose condition, though occasionally responding to questions, and with some stertor of the respiration.

October 17. First saw the patient to-day at 10 P.M., in consultation with the gentlemen above mentioned. Pulse, 68; respiration, stertorous; semi-coma; complains of pain in the head when questioned; left arm and leg paralyzed: both pupils contracted and insensible to light; eyelids closed, the right one swollen and livid from extravasated blood. On inspecting the head it appeared altogether out of shape from effusion under the scalp. After consultation it was decided to incise the scalp and ascertain the condition of the cranial bones. Consent of relatives obtained, a free opening was made; a large quantity of effused blood removed, and fracture discovered. On dissecting up the flaps a triangular piece of bone (measuring, when removed, two inches on each side and one inch at the base) was found crushed inwards and almost detached. It was removed by the elevator together with smaller spicula and loose fragments. Three fissures—one from each angle of the broken aperture—extend several inches into the surrounding bone. Seat of fracture: posterior and superior portion of right parietal bone. One fissure, extending towards the occiput, presented unevenness of its edges—one edge being depressed lower than the other. Reasonable force having been used, but without success, to restore this displacement, it was thought best to desist from any further operative procedure and leave the case to the resources of nature. During the latter part of the operation chloroform was administered, as the patient struggled violently and shocked the feelings of relatives by his cries. Wound closed by silk interrupted sutures; and ice applied. Bowels to be kept open by magnes. sulph.

Two days subsequently, Prof. Smith, of Baltimore, and Dr. N. S. Lincoln, of Washington, visited the patient in consultation with Drs. Higgins, Wells, and myself. At the suggestion of Prof. Smith, whiskey and water, equal parts, were applied to wound instead of ice. Symptoms unchanged.

20th. Part of the wound has healed by first intention, but another portion presents a suture torn out, and lips of wound pressed open from below by a protruding mass of brain, covered by its membranes, as large as an English walnut. If not watched he rolls about and rests the weight of his head upon this, or rubs his hand against it roughly with the greatest indifference. There is an offensive, sero-purulent discharge from the wound. Warm poultices substituted for ice dressing. So far there has been no fever, and no increase of nervous symptoms.

22d. Pulse 80. Somewhat improved. He hears and answers ques-

tions, but cannot see at all; there is well-marked strabismus (internal) of left eye. Left side paralyzed as before. The protrusion has increased in size; it is soft and insensible to the touch.

I was unable to visit the patient until after the 30th of the month. He was attended, *ad interim*, by Drs. Wells and Lincoln—the latter suggested “*styptic colloid*” as a dressing to the protrusion, and it was applied.

30th. Pulse 68. Paralysis of arm getting better; moves the fingers a little and the leg quite freely. Strabismus continues. The protruding tumour is marked with convolutions and sulci; there is very little discharge from it. The dressing now consisted in simple cerate on lint, with adhesive strips over all so as to exert firm pressure on the tumour.

Nov. 19. During the last two weeks he has steadily improved. Sight has returned. Perfect use of palsied arm, but motion of leg still much impaired. Mind clear. Appetite voracious. Pressure by strips of adhesive plaster has been continued; the protrusion has decreased in size. He was to-day placed on a mattress and driven nine miles (to Washington), in an ambulance without injury.

24th. General health good. Can walk with assistance and is able to sit up. In the sitting posture the protruding mass, especially towards its centre, sinks below the level of the surrounding skin, but bulges outwards when the recumbent posture is resumed. The granulating edges of the skin have become doubled inwards underneath the protrusion, so that hairs on the surface of the inverted scalp, growing as it were horizontally, have penetrated the mass and sprout up through its centre like blades of grass through the soil. Most of them were removed, but some were too deeply situated to be reached without subjecting the part to forcible manipulation, from which it was thought prudent to desist.

Dec. 14. Sulphate of copper has been daily applied with the plasters and compresses of linen over the wound, which has become level, smaller, and covered with granulations. Only abnormalities now remaining are imperfect use of left leg and drooping with protrusion of the eyeballs. The eyes protrude and the pupils are drawn perceptibly downwards, giving to the face an expression of staring or surprise. He travelled from Washington to Hagerstown, Md., by rail to-day and stood the trip well.

March 4, 1869. Patient called on me. He is in fair health. The wound healed, sunken, and covered with surrounding hair. His gait is somewhat awkward, and his whole body leans somewhat towards the right, while the left arm is carried somewhat extended as if to balance the body. Eyes still incline somewhat downwards, though the patient denies any defect either in the visual or locomotor organs.

January, 1870. His recovery has become complete.

CASE III. M. R., a mechanic, æt. 27, February 24, 1869, fell from the fourth story of a building, between two walls through a space just large enough to admit his body. He was severely bruised about the head and body, and was insensible for some time after the accident.

I visited the patient in consultation with his physician, Dr. Russel, three days after the injury. Pulse, 56 and full. Pupils both dilated and but slightly influenced by light. No stertor of the breathing. Motion of limbs perfect. He is very restless, kicking and struggling in the bed continually. Sight, hearing, and general sensation good. He responds to questions in an erratic manner; his mind is altogether deranged; he talks incessantly, or raves at the top of his voice, alternately praying, swearing, laughing, and crying. There are several severe bruises on the head,

but no fracture perceptible. Passes urine involuntarily. No alvine evacuation since the injury, though he has taken a purgative dose of calomel and jalap. Ordered croton oil gtt. j, and an enema of soap and turpentine. Cold to the head, and bromide of potass. gr. xx, every two hours.

28th. Symptoms the same. The medicine has not acted. Ordered gtt. ss of croton oil in mucilage every four hours until it operates. Cups to temples.

29th. Several involuntary evacuations after four doses of the oil. Somewhat more quiet, and has had a little sleep.

During the succeeding month he gradually lost flesh, became almost a skeleton, with ulcers on back, hips, knees and elbows. The penis resting in an earthen urinal has flattened from the pressure of its own weight and presents a sloughing ulcer on its inferior surface.

Up to this time the patient has been constantly raving and getting but little sleep. Involuntary evacuations from bowels and bladder. The treatment has chiefly consisted in cups and blisters to scalp and nucha, purgatives, bromide of potassium, and nutritious diet. Opiates were tried, but without any good result. He has had fever in the evening, and took a diaphoretic mixture.

April 1. Bodily he has improved. Bed-sores healing. Calls for assistance when desiring to pass urine or feces. Eats well and has gained flesh. Pulse and respiration natural. He still raves loudly most of the time, but there are longer intervals of repose than formerly, though he is never entirely rational.

May 1. Improvement of body has continued. On being questioned he answers correctly as to the locality of the house from which he fell, etc., but is entirely lost in regard to time. He talks and raves much at night, but has no recollection of having done so in the morning, except in so far as the repetition of his expressions bring back to his mind a vague remembrance of dreams.

He is not able to sit up, though daily gaining strength. Every hope is entertained of his recovery, but whether his enfeebled mind will be restored is more questionable.

July 26. *Sloughing of the Scrotum*.—Dr. C. M. FORD reported the following case:—

Captain A. I. K., æt. 28, seaman, entered Providence Hospital, April 26, 1869, with the following symptoms. Pulse 120, feeble and wiry; tongue dry, and coated with a thin, whitish fur; skin dry and hot; urine scanty and high-colored; bowels quite loose; mind wandering; slight tympanitis with tenderness and gurgling in the right iliac region. He states that three days previous to admission he first noticed a slight burning sensation in the scrotum followed by loss of appetite, fever, thirst, and diarrhœa. Ordered turpentine emulsion, beef-tea, milk, and milk punch.

27th. Quite delirious during the night; bowels loose. Attention was first called to his scrotum, which was dark-brown, and the cellular tissue filled with serous fluid. Made three incisions into the scrotum, and ordered flaxseed poultices.

28th. General symptoms as at last visit. Scrotum in a sphacelous condition; line of demarcation formed near the pubis passing around the base of the scrotum.

29th. Very weak; scrotum separating. Ordered charcoal and yeast poultices. Bowels not moved for twenty-four hours. Continued supporting treatment. Noticed a slight blush of redness in both iliac regions extending from the pubis to the anterior superior spinous process of the ilium with a slight swelling and tenderness on pressure.

30th. Discontinued the use of medicine. Nutritious diet. Scrotum almost off. General symptoms the same.

May 1. Removed the entire scrotum, leaving a healthy granulating surface over both testicles. Abscesses have formed in the cellular tissue of the abdomen where the blush of redness was noticed April 29. Discontinued poultices, using a dressing of lint and sweet oil.

2d. Abscesses discharging freely over the pubis. Ordered hips and upper part of the body to be elevated. Bowels not having been moved for four days, ordered *ol. ricini* ℥ss.

3d. Bowels moved twice from the oil; febrile symptoms subsiding; appetite better.

6th. Much worse. Bowels very loose, passing blood and mucus. High fever and great thirst. R.—*Plumbi acet. gr. iij, opii gr. ss*, every two hours, with turpentine stupes.

7th. Less fever; bowels better; no blood after third pill.

10th. Has been gradually improving; discharge from abscesses entirely ceased.

16th. Able to walk about the ward; new scrotum gradually covering the testicles.

June 1. Discharged with an entire new scrotum.

ART. XVII.—*Summary of the Transactions of the College of Physicians and Surgeons of the City of Reading, Pa.*

Retention of a Dead Embryo in Utero.—Dr. JOHN STEPHEN exhibited an embryo, with the placenta and membranes, and gave the following history of the case: On the 27th of July last, I was consulted by Mrs. R., aged 30, the mother of four children, in regard to her health, which, she stated, had been failing for four months past. She complained of lost appetite, sickness of stomach, irregular bowels, languor, debility, and depression of spirits. Her face was pale and sallow. She last menstruated in February preceding, and immediately after, as she supposed, became pregnant, the symptoms having been similar to those experienced by her in former pregnancies; about two months after which she sustained injuries from a fall; from that time her abdomen ceased to enlarge, her breasts became flaccid, and her health began to fail. The history of the case, with the symptoms and a vaginal examination, afforded an easy diagnosis.

Her womb contained, I informed her, a dead embryo, and if she chose to wait, nature would deliver her. On the 22d of August I again saw her. She was in bed, with a slight discharge of blood from the uterus, and moderate bearing-down pains. Upon examination I found the membranes protruding; slight traction, brought forth a six-weeks' embryo, enveloped in its membranes unbroken, with the placenta attached, in a per-

fect state of preservation. The after-hemorrhage was slight, convalescence was rapid, and the patient has since enjoyed excellent health.

This case is interesting in its being an exception to the general law regulating uterine action on the death of the embryo or fœtus, which is : 1. When an embryo is blighted during the early weeks or months of utero-gestation, it is usually expelled on its death. 2. When the ova die in early pregnancy, and are not expelled, but remain in utero for months, in nearly all cases, they are converted into hydatids or moles, or the placenta ; or chorion, become the seat of hydatigenous hypertrophy and degeneration.

In the beautiful specimen exhibited, though retained for four months after its death, neither the embryo, placenta, nor membranes, show any trace of change of structure or degeneration.

Another point of interest in the case is : That the embryo, placenta, and membranes were healthy—exhaling no unpleasant odour, having been preserved free from decomposition, while the liquor amnii was not lessened in quantity or quality.

Chronic Suppression of the Menses.—Dr. JOHN STEPHEN read the following history : Mrs. R., aged 23, was married at 16 : has borne and nursed three children without having once menstruated during the whole period of nearly seven years. The catamenia first appeared at about the age of 13 years, and continued regular with few exceptions up to the 29th day of March, 1863, the period of her last menstrual discharge. Her marriage took place on the 3d of April following, five days after the commencement of her last menstrual flow ; and her first child was born nineteen months subsequently ; the second child seventeen months after the first ; and her third two years after the second. After her first confinement the lochial discharge was suppressed, requiring active medical treatment to restore the flow ; after her second confinement the discharge was normal ; after the birth of her last child the discharge was again suppressed, requiring medical aid for its restoration. Her breasts and genital organs are well developed ; though her general appearance is anæmic. There has been no marked disturbance in any of the functions of the system, her general health remaining unimpaired. She has never had leucorrhœa, monthly pains, signs of menstrual congestions, nor any periodical mucous discharge indicating the process of ovulation. After Mrs. R.'s marriage, and after several menstrual periods had passed without any appearances, her breasts increased in size, her abdomen enlarged, and the usual signs of pregnancy were so well marked, that, quoting her own language : “ She commenced making ‘ baby clothes ’ but had to wait a year longer before she needed them.”

The suppression in this case being of long standing, not having been complicated with any serious symptoms ; and as the lady has, at no time during its continuance, suffered from any particular derangement of her general health, it is extremely difficult to account for the cause of suppression. I believe it to be one of those peculiar cases, depending on change of circumstances or habit, which sometimes occur in young females just married, in whom the discharge is suppressed for months in succession, accompanied by many of the symptoms of pregnancy, but in which the symptoms as a general rule, sooner or later, subside, and the menses again make their appearance : though there are exceptions like this, of sudden suppression from *moral*, as well as from other causes, that continue period after period without any return, and become cases of chronic suppression.

Rapid Delivery and Extrusion of an Ovum between the Sixth and Seventh Months of Utero-Gestation, with the Membranes Entire.—Dr. D. G. SCHENER narrated the following case: He was some months ago summoned to attend Mrs. L., who had been suddenly attacked with symptoms of abortion. On his arrival Dr. S.'s attention was directed to something contained in a bucket! which, on making an examination, proved to be a fœtus of between six and seven months, floating in the liquor amnii, with the placenta and membranes entire. There were no signs of life perceptible. The woman had seated herself on the "bucket" to attend to a call of nature, when a sudden, severe, bearing-down pain instantly expelled the ovum with the secundines entire. The mother rapidly recovered without any untoward symptom.

Hernia followed by Gangrene and an Artificial Anus; Spontaneous Cure.—S. R. RITTENHOUSE, M.D., reported the following case: About ten years ago I was called to see Mrs. K., aged about 50, who was suffering from violent colicky pain in the abdomen, accompanied with persistent and severe vomiting. I obtained the following history of her case: The patient had for many years an irreducible inguinal hernia. Six years before the time I was called to see her, she was attacked with pain and swelling in the hernial tumour. The difficulty, however, subsided without any injurious consequences. Two physicians, in attendance on this occasion, had told the patient that an operation was out of the question, because they were satisfied from the previous history of her case, that insuperable adhesions had been contracted. On the day before I was called to see her, she was engaged in the hay-field, and while in the act of pushing hay on heaps with a rake, the head of the instrument being caught by some object, the end of the rake-handle was forcibly impelled against the tumour. She immediately experienced much pain, which slowly increased in severity until I saw her the following day. Upon examining the tumour, it was found intensely red, tender, hard and swollen. Antiphlogistics were vigorously employed, but the inflammatory condition persisted. The bowels were completely obstructed: stercoraceous vomiting occurred, and symptoms of complete prostration were gradually developed. In about a week from the occurrence of the accident the tumour became gangrenous, and during a paroxysm of sloughing, the parietes of the tumour gave way, and through the opening thus made, feces were discharged. An immediate improvement in the condition of the patient was soon perceptible. The pain and vomiting ceased. The pulse, which before was weak, frequent, and almost imperceptible, became nearly normal. The extremities, from being cold, had their temperature restored. The cool and clammy condition of the skin disappeared, and the pinched, *Hippocratic* countenance was exchanged for one indicative of returning vigour. In fine, nothing remained to mar the patient's prospects of a speedy returning to health, save the *artificial anus*. From this continued to be discharged the contents of the bowels for some two weeks, when, happily, a discharge per anum took place. From this time the patient's stools continued to be passed in the natural way. Every day or two the discharge from the artificial anus became decreased in quantity, and at the end of several months from the time the stools took their natural course, the artificial opening had completely closed.

REVIEWS.

ART. XVIII.—*Third Annual Report of the Metropolitan Board of Health of the State of New York, 1868.* 8vo. pp. 626.

No more useful expenditure of means or employment of talent and knowledge can be authorized by a State than the prosecution of inquiries and the attainment of results such as are reported upon in this volume. With the skill and professional experience of the medical and sanitary officers engaged in its work, sustained by municipal power, the Metropolitan Board of Health of New York is enabled to present from year to year some of the most important contributions of our times to sanitary science. We are induced after careful perusal to give this testimony to their general value, without being ready to accept quite all the opinions and conclusions they have brought forward.

Probably no city in the world more palpably needs, even yet, in some localities at least, sanitary improvements to diminish a greatly excessive mortality. No better test of the truth of the principles of public hygiene can be looked for, than that of the production of salubrity among the population now herding in the tenement houses and slums of New York. To say that some very clear demonstration of the value of those principles has, already, been effected upon a considerable scale, is to do but scant justice to the able and energetic labours of Dr. Dalton, Dr. Harris, and their coadjutors.

Let us take an example of the need referred to, from one of the inspectors' reports, upon the condition, last year, of the "tenement houses," the details in regard to which may not be familiar to all our readers.

"Most of the tenement houses in the district are divided into front and rear apartments, the bed-rooms being in the middle or between the front and rear sitting rooms, *having no communication with the external air, and most of them had no means of ventilation except a door leading into the adjoining sitting or main room.* A few of these bed-rooms were supplied with windows communicating with the hall, and fewer still with ventilating flues in the wall; the latter of but little use for the purposes of ventilation. A scuttle in the roof could be left open during warm and dry weather, affording a current of air through the halls, but during rainy weather was always closed, leaving no means for the escape of foul air." p. 82.

Including under tenement houses, all those in which three or more families reside in apartments rented by the month, we are told that a little more than one-half of the entire population of the city is domiciled in them. Block after block and street after street of these have a density of 250,000 to 300,000 souls per square mile. The seventeenth ward, which comprises less than one-fortieth of the total area of the city, contains not less than one-tenth of its whole population; giving but about 16 square yards for each person.¹ Its basement inhabitants alone number 3253

¹ Some whole squares have but six square yards for each person. p. 518.

(p. 503, note). In the tenement houses, during one quarter, the mortality was *three times* greater than in private and all other houses. Adding the number of those taken from tenement houses to hospitals to die there, the sum total is actually frightful; more than seventy-three per cent. of all the deaths in the city! It is unquestionably important that, in three of the worst wards of the city, such sanitary ameliorations as have been enforced have already produced a steady decrease in this mortality.

Among children, especially, the insalubrity of New York is beyond parallel. Their death-rate in the summer quarter of 1868 was greater than in previous years, mostly from the prevalence of diarrhoeal diseases. Dr. Harris, in his careful analysis of the facts, shows that this was not owing to increase of crowding, as that was mitigated by greater cleanliness and care in the tenement houses. Nor was there any epidemic present, nor any unusual defect or evil connected with the sewerage. He concludes, therefore, that the inordinate mortality amongst children was due to "the long-continued hot and damp weather, and the injurious agencies which such weather called into activity." Of those agencies, undoubtedly the most important *factor* must be the foul atmosphere. Effort was made, by local use of disinfectants, to remedy this; but all such efforts appear to have proved feebly palliative only.¹ As urged by Mr. G. B. Lincoln, in his report as President of the Board,

"Instead of removing from the crowded tenements the filth generated in and around them, it would be better for all to remove the overcrowded population to the neighbouring country, where cheaper and better dwellings could be procured, surrounded by plots of ground and supplied with pure air and ventilation. In the spaces about the houses, a cow or goat could be kept to furnish food for the infants, and the general comfort and well-being of the residents would soon be so well established that they would never consent to occupy unhealthy homes again. This cannot be done until means are provided by which the labouring population can return to their work expeditiously and at little expense. Steamboats, railroads, elevated or subterraneous, to carry passengers quickly and cheaply through the city, deserve approbation and encouragement as the wisest of health measures." p. 10.

As an additional illustration of the need of such reforms, Dr. E. Harris has officially reported (February, 1869) the existence of *relapsing fever* in New York, the first time of its appearance there. It is said to resemble closely the "famine fever" of the North of Europe.

It is interesting to observe that, in the midst of so many circumstances unfavourable to longevity, some examples of it yet occur. We find it recorded that in 1867 five, and in 1868 four persons died over one hundred years of age. Honora Hanlon, the oldest, reached 108; Christiana Renfort, next, 105. The latter was a native of France, the former of Ireland.

With so large a volume, it is impossible, within our limits, to remark upon nearly all the topics presented. The most elaborate report, occupying 176 pages, is that upon "Investigation relating to the Texas Cattle Disease; with reference to certain practical questions in hygiene." It constitutes a treatise; probably the most important yet published on its subject. The multifarious labours required for its preparation were participated in by many observers. Principally, Dr. Moreau Morris, as Sanitary Inspector, Dr. R. Cresson Stiles, as Pathologist and Micrologist, and Prof. C. F. Chandler, as Chemist, led the inquiry. Finely coloured

¹ In the streets, it is said that "practically this was not a success." p. 95.

illustrations, by R. Koehler, add much to the interest of the report, and do all that can be done in that manner to convey information. Let us endeavour to sift out the main facts and conclusions set forth.

First, as to the mode of occurrence of the "epizootic:"—

"On the 27th day of April, 1868, a herd of nine hundred and thirty Texan cattle were purchased in Colorado County, Texas. * * * * * They came into the western border of Warren County on the 12th of June, 1868. There was a loss of forty-four head, only eight hundred and eighty-six of the nine hundred and thirty reaching Warren County. Those cattle were from four to six years old, all apparently in good condition, nothing indicating any disease whatever; there were "ticks" on very many of them. This herd is still (August 31st, 1868) in Warren County, all doing well, no disease having made its appearance among them; not one has died, notwithstanding more than five hundred native cattle have died around them. This herd of Texan cattle, on the 12th day of June, 1868, passed over a certain piece of prairie pasture on the western boundary of Warren County. On the 19th day of June, a lot of native cattle, numbering ninety-five head, were permitted to graze upon the same pasture, and continued to feed upon the same until the 4th of August, 1868. One of the herd was noticed to be sick on the 28th of July, and up to the 4th of August, eleven were sick and three had died. On the 4th of August the other eighty-four were driven to West Lebanon and shipped for the New York market. This, I presume, is the herd of sick cattle referred to in Dr. Harris' letter. There were other cattle shipped with them; but the sickness was confined to the eighty-four head exposed to the Texan cattle; at least had herded upon pasture passed over by Texan cattle. * * * * *

As a fact, wherever native cattle have passed over ground where this Texan herd have been, the native cattle have sickened and died. It is also a fact, that other Texan cattle have been brought into this county, have been herded with native cattle for two months, and as yet no disease has made its appearance. We have had over four thousand head of Texan cattle in this county this summer." p. 186. (Letter of Capt. Jas. Park, Williamsport, Indiana.)

Not having room to trace the successive stages of the history of the diseased cattle, it may just be added that eighteen of the above-named eighty-four died on the way, in herd-yards on the Erie railroad; the rest were, August 10th, hurried on to New York. It is remarked that "the speculators who dealt in such stock regarded a hurried transportation to the New York market as the shortest and surest way to avoid the losses liable to be incurred by keeping such cattle for a day longer than their circumstances compelled them to keep them." The time of incubation, after exposure to the cause of the disease, is asserted to be about twenty days.

Another citation of facts we may give in Dr. Moreau Morris' words.

"First, cattle that were supposed to be natives of the Western States, and that had arrived from Painesville, Ohio, in the ordinary course of traffic and transportation, began to show symptoms of disease within a week from their time of shipment from Painesville. The true Texas cattle disease, as has been shown in Dr. Harris' correspondence, was at the time prevailing in Summit County, Ohio. That these cattle, which were at least reputed to be native stock, and communicated the disease to the healthy herds of the district with which they were pastured in common, did communicate the same kind of fatal disease that killed several of their own number, does not admit of the shadow of doubt. In the absence of those exact methods of investigation which the medical anatomists pursued in our cities, we do not hesitate to take the straightforward testimony of experienced herdsmen, who saw the disease and described it to us. In two post-mortem examinations which Health Officer Dr. Montfort and I made at Hamptonburgh, in the month of October, we were able to recognize the disease by the usual post-mortem evidences, and better still, by the particularity and completeness with which the entire history of events and symp-

toms of these cattle was related to us. Here was the history of eight fatal cases of the Texas cattle disease in three different herds, in which no ground of doubt existed, that exposure to the western cattle constituted the starting point and source of the disease; and viewing these eight cases purely upon medical evidence alone, we might safely conclude, reasoning by exclusion, that the western cattle brought the disease into these herds." p. 226.

Upon one point concerning the above cases, doubt yet remains; whether the cattle shipped from Painesville, Ohio, "reputed" to be native cattle, were really so. The chain of evidence concerning the transmission of the disease from Texas through Ohio cattle is thus weakened.

A very intelligent farmer of Illinois, P. A. Atkins, writes as follows:—

"I have *no reason* to believe that native cattle, even under circumstances the most favourable for infection, will infect other native cattle. Not *one* of the many I have seen die of this disease but that was exposed to infection from Texas stock; and not *one* of those in this vicinity, now living, but that was exposed to sick native cattle." p. 243.

The practical conclusions arrived at by Dr. M. Morris are very important.

"The experience of the past summer indicates the necessity for—

"*First.* Regulation and police under a uniform law, applicable to all the States through which pass the great transportation routes for market cattle, in order that the first evidences of any contagious disease may be arrested. *Second.* Such control to have sufficient State authority to compel transporting agents, owners or their aids, to take proper care of their stock in regard to rest, feeding, and watering at stated intervals of time during transportation, and up to the time of slaughter. *Third.* Skilled medical inspection at stated points; all diseased animals to be at once slaughtered or held under observation until all danger is passed. This inspection to be continued during the whole year. *Fourth.* All animals at the slaughter-houses to be critically examined at the time of slaughter, and the beef so marked that any consumer may be assured of its having been properly inspected. *Fifth.* Such authority to be given that all diseased meat may be seized and disposed of in such a manner as to prevent its being eaten. The results of such control and inspection will be the public assurance that danger to health and life from this source will be reduced to the least possible degree, that fraud and deceit will be under control, and that the aim and efforts of enlightened sanitary laws shall be supported and enforced." p. 232.

The urgent need of the second of the above provisions is fully shown by another writer, J. Stanton Gould, who, in a paper on the subject, asserts that the inhumanity of the treatment of Texan cattle in their transportation from the West is such as to cause an average loss of a hundred pounds per head of weight during the passage to New York.

It will be impossible for us to do justice to the almost exhaustive pathological inquiries whose results are given in this Report, without longer and more numerous citations than we have room for. The signs of the "Texan Disease," pronounced unequivocal, are the following: 1. A greatly increased temperature of the body and blood; this is the first discoverable symptom. 2. The muscle of the animal is dark red; the fat of a deep brown yellow, in intense cases with a green bronzed tinge. 3. The spleen is enlarged, engorged with dark blood, and softened. 4. The abomasum, or fourth stomach, on its inner pyloric portion invariably presents sloughs, erosions, and deep excavated ulcers of various forms and extent. 5. The kidneys are generally enlarged, dark, congested, and softened. 6. The liver is enlarged, heavy, generally fatty or waxy, its ducts injected with bile, and its colour yellowish-brown.

The elevation of *temperature* ranged in sick cattle from 104° Fahr. to 109°; from 106° to 107° was frequent. Toxæmic *disorganization of the blood* was shown by symptoms, and by marked alterations discovered in the blood on inspection.

"The wasted, crippled, and shrunken red globules; the transudations and ecchymoses resulting from this drainage of the vital fluid; the injurious and obstructive presence of resultants of this damaged blood in the tissues of the liver; the overwhelming of the spleen by the debris of the *spoiled* blood; the view which the microscope revealed of the condition of the debris and of the splenic tissues in the fatal stages of the disease, and during successful convalescence; and lastly, in cases that lingered beyond the acute stage, the presence of crystallized *hæmatoidine*—that beautiful signet and memorial of the destroyed blood-globules and consequent transudations—in all loose tissues and the chief secernent viscera of the body, presented, together and in their various relations, the most remarkable, the most instructive, and, when studied with all the associated facts, the most conclusive results that could be met with in the physician's searches into the nature and consequences of pestilential diseases." p. 289.

Chemically, Prof. Chandler found the blood, even of cattle convalescent from the disease, to be remarkably deficient in red globules and globulin, in salts, albumen, and total solids. The decrease in solids amounted to 50 parts in 1000 of blood. *Albuminuria* was in all cases observed. Examination of the liver especially, and analysis of all the characters of the disease, have led Dr. Stiles to appreciate highly its resemblance to the yellow fever of human subjects; so much as to suggest the expression that it may be called "*the yellow fever of cattle.*" (p. 309.) The peculiar coloration of the liver in both, he believes to be due to the presence of broken-down blood corpuscles mingled with the bile.

But perhaps pathologists will find the most interesting part of the Report to be Dr. Stiles' account of the "attempts to cultivate the *fungus-spores* that infest the blood and bile of the infected cattle." Besides his own experiments, Dr. S. obtained the aid of Prof. E. Hallier, of Jena, in the inquiry, by transmitting to him sealed specimens of fresh bile from some of the diseased animals. Prof. Hallier's results are described in his published letters (p. 311, *et seq.*), and accord very closely with those which Dr. Stiles and his associates obtained. The topic of "fungus culture" has been so recently brought before the readers of this Journal (Oct. 1869, p. 520) in a notice of the Report of the U. S. Commissioner of Agriculture, that we would not be justified in dwelling upon its details here. Dr. Stiles has been inclined to caution in his investigations, and to moderation in his views; being mindful of the

"numerous disappointments of microscopists, whose spores and germs of disease have sprouted luxuriantly for a while in popular reputation, but have had a mushroom duration only in the annals of science. I am aware," he adds, "that the micrococcus and torula forms of fungi, alike in all, give no evidence of their nature and origin, and that all that can be said respecting those I have had under my observation is, that it is possible that these germs, developing luxuriantly in the bile and voided with the feces, may be the source of the contagion which proves so fatal in the western pastures where Texan cattle have occupied them in advance of native herds. Whatever may be the bearing of these researches upon the etiology of the disease, they have an abstract interest and value independently of their practical application."

"According to recent researches, the different stages in the development of the same fungus possess very different properties, and react very differently upon the human system. Thus, the best authorities assert that '*achorion Schoenleinii*', which is known to be the cause of *herpes circinatus* and of *favus*, as I have proved also by my own experiments, is but an oïdium form of the

same plant, which gives origin to *penicillum crustaceum*. If so, what limit can be set to the morbid capabilities of the commonest species of fungus? Their capacity for mischief must be as varied as the conditions of their development. So pliable are these low forms of vegetable life, that their injurious influence upon the human system, and upon the animal organism, need not be sought in their specific character, but may be ascribed to a virulence acquired by the circumstances, conditions, direction, and degree of their development."

Hallier's conclusion is, that, in the bile of these cattle, "the fungus of which the micrococci and the cryptococcus-like cells take their origin, is a species of the germs *coniothecium*." He regards it as *ancrophytic*, i. e., growing only in materials or situations excluding the influence of atmospheric air. He calls it, after its discoverer, *Coniothecium Stilesianum*. Hallier adds, "At all events, *it is a parasitical fungus, growing on plants, and to be looked for in the food of the wild bullocks*." Our readers may recollect the statement made in the October number of this Journal (*loc. citat.*) of the entire failure of a distinguished botanist, J. W. Ravenel, to find any plant allied to the above-named *coniothecium*. This is only negative proof. The whole question must remain at present *sub judice*. Experiments in fungus culture are undoubtedly attended with great difficulties. Nor does the presence of any parasite *in connection with* a particular form of disease at all prove it to be the *cause* of the malady. Still, all such labours have their value, and, however doubtful the reward of present reputation may be, they should, in the interest of science, be encouraged.

The next important document presented in this volume is a "Report on Vaccination, in reply to a letter from Drs. Whitney and Carnochan, to the Metropolitan Board of Health." The letter of these two physicians, honoured with this answer, is one of the most remarkably ill-considered professional communications we have ever read. Witness the following language (p. 339):—

"It is, however, a lamentable fact that much is improperly collected from unworthy and questionable sources, and sold under the name of vaccine virus, which is impure and comparatively worthless. Vaccine virus of this questionable character does, no doubt, find its way into common use in this city, and even in the country, as much of that used in the country is obtained here. *Hence the general objection to vaccination on account of the vitiated character of the virus*, through which, it is believed, *various forms of scrofula, and other constitutional or malignant diseases are too frequently introduced* into families, who, prior to this process, were entirely free from such taint or development."

The Italics are ours.

The same letter urges the superior efficacy and safety of vaccination directly from the kine; the virus being conveyed from heifer to heifer, as proposed by Palasciano of Naples a few years ago.

The Sanitary Committee of the Metropolitan Board of Health, consisting of Drs. J. O. Stone, Willard Parker, and James Crane, addressed a series of inquiries to Dr. J. P. Loines, Vaccine Physician, whose large and long-continued experience and study of the subject entitle him to be regarded as an expert and authority upon it. His letter of reply is able and exhaustive. We believe that its separate publication (somewhat condensed) would serve a useful purpose as a tract in defence of vaccination before the community. He shows conclusively, upon the basis of the experience of 110,000 vaccinated infants, from 1849 to the present, and of ten years' familiarity with direct vaccination from the cow, that the charges and suspicions thrown upon vaccination are altogether unfounded. Their reputation is also fully confirmed by the records of the National

Vaccine Establishment of Great Britain; in which, in six years, ending 1856, more than 54,000 children were vaccinated, and brought back for eighth day inspection, and to afford lymph for distribution. Dr. Loines is certainly well prepared to assert the safety of the eighth-day vesicle, after having himself distributed over 400,000 charges of lymph to physicians without any known injury whatever. His belief is positive, that the vaccine process is a specific one, *the early lymph not partaking of the child's constitutional taints*; although its maturation may be interfered with by ill health. Also, "in numerous instances in which the vaccine virus has been taken from subjects exhibiting symptoms of syphilis, no transmission of the disease has occurred." (p. 348.) The now famous Rivalta cases are, after Abertetti, Ricord, and others, set aside as exceedingly imperfect evidence; as, to use the words of the former, "the events present to view two conspicuous, but wholly distinct facts; viz: the vaccination of the infants, and the subsequent occurrence of syphilis in certain of their number." It was apparent that the vaccinations had been performed in violation of Jenner's rules, mixing blood, and probably other matter, with the virus; and it was not proved that no other source of syphilitic infection existed in the cases affected. The report of the American Medical Association is quoted thus:—

"If it were now possible to collect all such cases, even then their utter insignificance, when compared with the multitude that have unknowingly been vaccinated with lymph taken from diseased persons without contamination, is such that this evidence alone against the transmissibility of other diseases by vaccination would be sufficient to establish the conclusion as a general rule that there is no danger of communicating other diseases with vaccinia."

This conclusion, it is added, is in keeping with the recorded experience of Heim, Ricord, Bosquet, Tanpin, Landomry, Friedinger, Marson and many others. Dr. H. Lee's rules, given in his paper on syphilitic vaccination, are as follows:—

"1st. Always use a clean instrument. 2d. Take lymph not later than the eighth day from the vesicle. 3d. Take lymph only, and not allow blood or other secretions to be mixed with it. 4th. Obtain the lymph from a healthy subject."

These correspond with Jenner's original directions, and are abundantly sustained. Dr. Loines, without at all depreciating the safety or efficacy of the mature *scab*, which so many of our practitioners constantly use with entire satisfaction, clearly prefers the "eighth day lymph;" taken from arm to arm in the fluid state, or dried and carefully preserved by seclusion from heat, moisture, and strong daylight.¹ That the specific process, whose characters manifest themselves with the first rising of the vesicle on the fourth day, is maintained as such throughout, to the falling off of the scab from the nineteenth to the twenty-first day, there is ample reason to believe. Yet it is a question worthy of consideration, whether all might not be more completely armed against the cavils of the ignorant and of malcontents in any quarter, if the lymph from the eighth day vesicle alone were used; the true "Jennerian" vaccination.

Dr. Loines gives valuable testimony of his experience with "bovine vaccine." That obtained by inoculating the cow with human smallpox virus, should be excluded on the ground of the danger of tampering with

¹ The London National Vaccine Establishment distributes lymph in three modes; 1, liquid, in sealed capillary tubes; 2, dry, on ivory points; 3, dry, between plates of glass.

that virus in any way. The other sources resorted to are, the spontaneous or sporadic "vaccinia" or cow-pock, and retro-vaccination, from man to the cow. Dr. Loines has found, with both of these, more frequent failures than with human lymph, and a slower process when successful; but after two or three removes, the phenomena became "Jennerian." The violence of the local symptoms, reported by a number of those who have used bovine vaccine, is believed by Dr. Loines to be owing to the less pure condition of the latter as it is usually obtained. The French report upon the subject admits a failure of over fifty per cent. in primary vaccination from the cow. With arm to arm vaccination, Dr. Loines has had ninety-eight per cent. of successes. The arguments urged against the substitution of bovine for human virus, as the general rule, are cogent.

"The dangers which would ensue from inoculation of vaccine from the cow would be greater than with that from man; because they would be more difficult to avoid on account of: 1st. The irregular course of vaccinia in the cow. 2d. The difficulty of obtaining the pure, watery lymph alone, by reason of its irregularity and the rough, hairy base. 3d. Our comparative ignorance of the phenomena of the external and internal diseases of cattle."

It is, moreover, absurd to suppose that there is any peculiarity in the bovine system to prevent the vaccine matter from gradually losing its power in going from cow to cow, as much as in passing from one to another of the human species. And, in view of the appeals to popular ignorance and prejudice, even in the time of Jenner there were fears as portentous as any lately expressed—concerning inoculation "from a filthy brute." These would not be hard to renew and cultivate, were any so disposed.

Being convinced by abundant experience that human vaccine, properly selected, used and preserved, does *not* deteriorate, Dr. Loines urges emphatically the maintenance of public confidence in it, and the still more extended enforcement of it in public schools, and among all who are subjects of public charity and police supervision; with proclamation to the people of its safety and universal necessity. We regard it as the manifest duty of the profession to uphold these principles. Every year some practical confirmation of them occurs; as in the approach to the extinction of smallpox where (*e. g.*, Providence, R. I.) vaccination is most nearly without exception—and in the destruction in a single year of five hundred in a thousand of a tribe of Indians, such as occurred this year in Montana. In Ireland, Dr. Cameron, of Dublin, asserts that, while in the decade ending in 1841 over 58,000 persons died from smallpox, under thorough vaccination the number decreased, so that in 1868 *no cases* occurred in the country. Dr. Anstie has called attention (in the *Practitioner*) to similar evidence in Scotland.

Many other subjects of high importance in public hygiene are fully and ably reported upon in the volume before us; but we have space only to enumerate some of them. Public baths, drinking fountains, and urinals; foundlings and nurseries; returns of coroners; inspection of slaughter-houses; drainage and sewerage; street cleaning; removal of night-soil, &c.; rescue and resuscitation of drowning persons; the gas nuisance; the water supply; quarantine; all of these receive their share of attention, and, upon all, interesting and useful information is afforded. We repeat, that this report of the Metropolitan Board of Health of New York contains more valuable matter, for the promotion of Sanitary Science, than any other volume of the year, at least in this country.

H. H.

ART. XIX.—*Ophthalmoskopischer Hand Atlas*. Von EDUARD VON JÄGER. Large 8vo. pp. 236. Wien, 1869.

An Ophthalmoscopic Atlas. By EDWARD VON JÄGER.

Lehrbuch der Ophthalmoscopie. Von Dr. LUDWIG MAUTHNER. 8vo. pp. 468. Wien, 1868.

A Text-Book of Ophthalmoscopy. By LUDWIG MAUTHNER.

THESE books are complements, the one to the other, and together form the most valuable and complete treatise on the ophthalmoscope and its application now before the public. Their authors may be to some extent regarded as professor and pupil. Dr. Jæger, long professor extraordinary in the University of Vienna, and well known to all versed in ophthalmic surgery as the first to introduce into practice the test types as a measure of the acuity of vision, and as having, by the publication of his works, *Staar und Staar Operationen*, and *Ueber die Einstellungen des dioptrischen Apparats*, essentially contributed to our knowledge of the pathology of the eye as well as of the anomalies of refraction and accommodation, has, after a silence of some years, again appeared before the public in this new Atlas, and Dr. Mauthner, formerly his assistant, and now Privat. Doctent at the same University, gives us a text-book on the Ophthalmoscope, and refers to the plates in the Professor's Atlas for his illustrations.

In his preface, after a severe, but, for the most part, deserved, criticism on many of the ophthalmoscopic plates hitherto published, Prof. Jæger explains the method in which his own illustrations have been prepared, and informs us that he has in all cases prepared two sketches of the eye-ground, one as seen in the erect, the other in the inverted image, and then compared these so as to have his attention called to any possible oversight. He further claims that there is no touch of individual phantasy in any of his drawings, but that every line, dot, or shade of colour is as near an absolute reproduction of the original as it was possible for his eye to appreciate, and for his hand to execute. As to the colour and tone of the eye-ground, it is always represented as seen by an oil lamp with the Helmholtz "weak light" mirror. To attain this end the author has necessarily given to the preparation of his sketches much time and labour—usually twenty to thirty sittings from two to three hours each, and often even a greater expenditure of time. He states that, in so doing, his object has been to present to the profession something which will not be ephemeral in its nature, but will always afford food for thought and reflection to the student. For similar reasons he has contented himself in his text with a clinical history of the case, but has given no explanation or theory as to the causes and signification of the various conditions which he has sketched, believing that in the present state of pathology, all such theories must be shifting, and of only transient worth. The writer having had an opportunity of seeing some of the cases here depicted, and of comparing them at the time with Prof. Jæger's drawings, can vouch for the almost incredibly minute and painstaking accuracy with which they have been executed. Such plates are Fig. 72, representing a new formation of vessels in the vitreous humour, and Figs. 87 and 88, of coloboma of the choroid. It is, however, to be regretted that the chromo-lithographic plates of Dr. Heitzman, although in their essentials correct, are, in point of tone and colour, far behind the original water-colour drawings of Prof. Jæger. The Atlas

contains one hundred and twenty-eight plates, and of these the first twenty-four are devoted to illustrations of pathological changes in the refracting media, more especially those of the lens and vitreous humour, no representation of any corneal opacities or changes having been attempted. This of itself is a striking feature of the Atlas, those previously published confining themselves to a representation of the changes in the eye-ground. The colour of the light reflected from the fundus is in these plates of purer yellow, and of a different shade from that which we receive even when using the Helmholtz mirror; but the difficulty of the subject is very great, and some of them remarkably successful, *e. g.*, Figs. 10, 14, and 16, the first two representing cases of senile cataract—Fig. 10 commencing in the anterior cortical substance near the periphery, Fig. 14 the same in both anterior and posterior cortical layers, and Fig. 16 showing the appearances presented by zonular cataract. Cataract, as is well known, is usually progressive, or at best stationary. There are, however, several rare but well-attested cases of its retrogression in those forms supervening upon disease of the choroid, and after injury. Such a case is that represented in Fig. 9. The patient, a school teacher by profession, in his 20th year, with myopia $\frac{1}{2}$, on account of pain in his eyes, and a diminution in the acuity of vision, was obliged to give up his work. On examination with the ophthalmoscope, the right eye exhibited, in addition to a large conus (staphyloma posticum), and an atrophy and disappearance of the choroideal epithelium, well-marked commencing cataract principally in the anterior cortical layers. Under a continued treatment for the choroiditis, in two years the opaque stripes had much diminished, and in five years entirely disappeared.

In Fig. 14 we have a case of cataract in a woman of 30 years of age, with emmetropic eyes. The left eye presented the appearances given in the plate, and with it she could only read Jæger No. 12 at a distance of six to ten inches. Seventeen years later (*æt.* 47), the opacity had decreased, as shown not only by comparison of the drawing with the eye, but also by her own statements, and by the test types. With that eye she could now read Jæger No. 7 from six to nine inches.

Fig. 19 is an admirable representation of a dislocation of the lens downwards.

Fig. 20 shows us an extravasation of blood in the canal of Petit following overwork in the July sunshine, by a man addicted to drink (*æt.* 27)—of course only visible with fully dilated pupil, and when looking very obliquely in the eye.

The representations of the eye-ground commence with three normal and emmetropic eyes in individuals with black, brown, and very light hair, and Fig. 28 gives us the fundus of an emmetropic albino.

Figs. 31 and 32 give instructive pictures of a case of astigmatism as seen in the upright and inverted images. Then follows a remarkable case of division of the fibres of the optic nerve into an upper and lower bundle as they spread out to form the retina. Then three pictures of nerve fibres which, after entering the retina, still retain their medullary sheath (usually ending at the lamina cribrosa).

The colour of the optic papilla often affords us a valuable means of judging of the condition of the nerve fibres, and in addition to the ordinary blanching in atrophy, we have also other changes of colour, particularly to the various shades of green and blue. Any such tints are much more readily diagnosticated with the Helmholtz mirror (plane glass) the large

quantity of light thrown by concave mirrors often drowning any slight change of colour. In addition to seven plates of various forms and stages of atrophy, all of them with more or less departure from the normal colour of the papilla, the author gives in Fig. 40 a curious case of congenital greenish discoloration of the papilla in an emmetropic and healthy eye with the normal acuity of vision. There are numerous plates of excavation of the optic papilla, four of physiological excavation, and nine of glaucomatous. Among the latter, Figs. 53 and 54, showing the appearance of the same eye according as you accommodate for the top or bottom of the excavation, and Fig. 60 with a glaucomatous and physiological excavation in the same eye, are particularly instructive. There are also three plates of glaucoma occurring in myopic eyes.

The author justly devotes much space to changes in the retina, ten plates to the various forms of irritation and inflammation of the retina, five to certain anomalies in its structure (*Netzhaut Stränge*), and five to retinitis pigmentosa, or, as he terms it, "typical pigmentary degeneration of the retina." One of these, however, Fig. 76, seems to us unjustly classed under that head, for, although the pigment is mostly in the retina, and some of it anterior to the bloodvessels, yet the patches have not the usual stellate form, and the clinical history shows that there was no limitation of the field of vision. Fig. 70 gives the appearances, in a recent case of embolism of the central artery of the retina. Then follow two pictures of retinal separation, a cysticercus, and a new growth in the vitreous. There are nine plates of changes in the region of the macula lutea, many of them rare, the small amount of attention, however, hitherto devoted to this most important region, and the optical difficulties which tend to prevent our getting a distinct view of it, render all of them interesting. The diseases of the choroid close the volume. These constitute in all twenty-four figures of choroiditis and choroido-retinitis—varying from slight degrees of *conus* and absorption of the pigment epithelium of the choroid to cases where there is extensive disease of the whole fundus. Fig. 103 is an admirable portrait of rupture of the choroid, rather a rare lesion, but of which the writer had an opportunity of observing two cases while attending Prof. Jæger's clinic in Vienna, all produced by direct violence, and without injury to the sclerotica.

In Fig. 121 we have a specimen of tubercles in the choroid, a form of disease which has assumed considerable diagnostic importance since Cohnheim has demonstrated by numerous autopsies that it is almost an invariable accompaniment of acute tuberculosis. The case here depicted, however, is one where the disease had run a chronic course. The patient had all his life been affected with inflammation of the glands of the lids, was highly myopic (Glass $5\frac{1}{4}$), had then only a quantitative perception of light, and was suffering from well-marked tuberculosis pulmonum. He had noticed a gradual diminution of the power of vision for more than a year previous.

The tubercles are here represented as yellow prominences mostly in the region of the macula lutea. They are all of a much deeper yellow than the rest of the fundus, with well-defined borders, but without any pigment masses either at their edges or in the vicinity. There were similar appearances in the left eye, but the tubercles were more peripheral (near the equator bulbi), and consequently the power of vision was less impaired.

Dr. Mauthner has divided his book into ten chapters, as follows: I. The glow (*Augen Leuchten*) from the fundus oculi. II. The conditions

for the perception of the eye-ground. III. The refraction and reflection of light. IV. Construction of ophthalmoscopes. V. Examination of the refracting media. VI. The determination of the state of refraction. VII. The papilla of the optic nerve, and its appearances in health and disease. VIII. The retina and its diseases. IX. The choroid and its alterations. X. Pathological changes in the vitreous.

In the first two chapters we have an interesting account of the various steps which led to the discovery of the ophthalmoscope from the writings of Aristotle and Pliny, where it is mentioned that the eyes of certain animals and fish emit light, and so down through the various observations on the subject, and their often fantastical explanation, until, in 1704, we find that Méry had observed that by plunging a cat under water you were able to get a view of the details of the fundus, and in 1709 La Hire gave a correct explanation of this phenomenon. In 1846 Cummings,¹ and, in 1847, Brücke, independently of each other, published similar methods for obtaining the reflection from the human eye, and at last, in 1851, Helmholtz, in his *Description of an Ophthalmoscope for the Examination of the Retina in the Living Eye*, showed how it was that the refraction of light by the media of the eye usually caused the pupil to appear dark, that by placing ourselves (by means of a plane glass or perforated mirror in front of our own eye) in the direction of the entering rays of light, we could always get a reflection from the fundus, and how, under all conditions of refraction, a clear view of the eye-ground could be obtained.

The third chapter is an admirable *résumé* of so much of the laws of optics as are necessary for an understanding of the subject, and in the fourth we have some remarks on the methods of illumination, and of various special forms of ophthalmoscope, particular prominence being given to that of Jæger, with its plane glass (Helmholtz) mirror, and it is concluded by a description of the method of examining one's own eyes both by the upright and inverted images.

The fifth chapter treats of the appearances and nature of opacities in the cornea, lens, and vitreous humour, and gives us the following method for ascertaining the seat of fixed opacities. After describing the method of lighting up the pupil, and ascertaining by the use of oblique illumination, and by the presence of the image given by the surface of the posterior capsule of the lens that the cornea and lens are healthy, we know that any remaining opacity must lie in the vitreous, and, to ascertain its exact seat, the author recommends the following plan:—

“If we suppose that a row of opacities are situated in the line of vision of the observed eye, one behind the other, respectively upon the anterior capsule in the lens substance, on the posterior capsule, and in the vitreous, they will appear as a single opacity so long as the line of vision of the observer coincides with that of the patient. If, however, while the mirror and line of vision of the observer maintain the same position, the observed eye turns to either side, and the pupil is sufficiently dilated, all the opacities appear in our field of vision. Such an opacity, if it chance to be in the centre of rotation of the eye, will naturally remain immovable, because that centre is itself stationary, while those which lie before it will move in the same direction in which the eye itself moves, and those behind it towards the opposite side. The greater the distance between the centre of rotation and the opacity, the greater will be the movement made by the latter.

“In using this test we must remember that we are apt to judge of the direction of the motion according to the position of that portion of the pupillary

¹ See No. of this Journal for July, 1847, p. 248.

margin to which the opacity approaches. It is, however, manifest that when we move the eye to the right any spot in the lens would apparently approach the left and not the right margin of the pupil, because the iris in front of the opaque part of the lens would make a more extended movement. We should, therefore, commit an error if we concluded that because the opacity apparently moved in the opposite direction that it, therefore, lay behind the centre of rotation, and, consequently, in the vitreous. The reflection (image) on the cornea must be our means of judging. At the commencement of the experiment the corneal image and the centre of rotation lie both in the direction of the visual axis of the observer. If now the observed eye rotates, two points in space remain immovable and in the same line, viz., the corneal image and the centre of rotation. An opacity, therefore, at the centre of rotation remains in all positions covered by the corneal reflection. All other opaque spots move in one direction or another; those in front of the centre of rotation increase their apparent distance from the corneal reflection in the same direction in which the eye moves, and those posterior to it in an opposite one. Now the centre of rotation of the eye lies in the vitreous, nearly in the middle of the line of vision. According to Donders, it is behind this point 1.76 mm. in emmetropic eyes, and, therefore, is $13\frac{1}{2}$ mm. distant from the anterior surface of the cornea, while, according to Helmholtz, the posterior pole of the lens lies 7.2 mm. behind it (the cornea). Therefore, the centre of rotation in emmetropic eyes is nearly 6 mm. behind the posterior pole of the lens. In myopia dependent on increase in the length of the antero-posterior diameter of the eye, the centre of rotation, according to Donders, is still further behind the posterior pole of the lens, while in hypermetropia, caused by a shortening of this axis, it retains nearly its normal position. It follows, therefore, from the foregoing that when the eye moves, opacities in the cornea describe the greatest arc, those on the anterior capsule and in the substance of the lens less extensive arcs; those at the posterior pole of the lens still more limited movements, but that it will not be possible for the corneal reflection to continue to cover opacities in the posterior capsule; therefore, those opacities which are so frequent in cases of choroiditis and retinitis pigmentosa, and usually considered to be in the vicinity of the posterior of the lens pole, really have their seat in the vitreous."

The chapter on the determination of the refraction of the eye by means of the ophthalmoscope is the most brilliant and complete in the book. Inasmuch, however, as Dr. E. G. Loring has in the present number of this Journal given an admirable *résumé* of it—together with illustrative cases, diagrams, remarks on the subject, and a description of a new ophthalmoscope—any further notice of it is here unnecessary. In his chapter on the optic papilla the author gives a description of its anatomy so far as it influences the ophthalmoscopic appearances, and after noticing its normal appearance, the anomalies sometimes presented in its anatomical formation, and the distribution of its vessels, devotes a few words to the changes of colour and senile metamorphoses, and then gives the following interesting abstract of its changes in glaucoma and the various opinions prevalent during the last twenty years concerning this disease which has caused so much discussion among eye surgeons.

After a eulogy on Von Gräfe, in which Dr. Mauthner pronounces his discovery of the curative effect of iridectomy in glaucoma as one of the greatest ever made in the whole field of medicine, he thus proceeds:—

"Edward Jäger was the first who (in 1853) recognized the appearances which the papilla presents in glaucoma, and gave us a truthful delineation of them. It would be really difficult to-day to produce a picture which (apart from its technical execution) would give in a more graphic and truthful manner the alterations in the optic nerve in fully developed glaucoma, than that presented in the 8th Table of his work on 'Cataract and Cataract Operations.' The interpretation of it was, however, obscure; he speaks of the 'ap-

parently' prominent papilla, but says not a word as to its real form. In 1854 Von Gräfe¹ pronounces the peculiar aspect of the opticus to be caused by its prominence. 'The changes in the opticus consist in its forming in its whole periphery a markedly prominent and round hillock.' In the following year (1855) A. Weber² published an essay entitled 'A Case of Partial Hyperæmia of the Choroid in a Rabbit,' and in describing the ophthalmoscopic appearances which a careful subsequent dissection proved to depend upon a marked ectasia of the sclerotic at the posterior pole of the eye, called attention to the errors which we are liable to make in judging of differences of level in the eye ground. He details the means of freeing ourselves from these deceptions of the senses by which he had been enabled in the foregoing case to prove the existence of an excavation, when even observers competent to use the ophthalmoscope who examined this eye could not convince themselves that the greater part of that disk was really deeply excavated, but on the contrary saw a well-marked tumour-like prominence. Nevertheless Weber neglected the most important application of his theory; he should in a similar manner, and with equal discrimination, have judged of the differences of level presented by the glaucomatous nerve. He not only did not do this, but speaks of a symptom (the sudden apparent intermission of continuity in the vessels and the movement of the cut ends towards each other) to which Herr Dr. Gräfe had already called attention in glaucomatous prominence of the optic nerve. Von Gräfe himself, however, was more alive to the importance of Weber's observations.

"A note³ in a notice of the position of the ciliary processes in distension of the sclerotica, is too important to be allowed to escape notice here. As regards the form of the entrance of the opticus, careful dissections will yet be called to prove many optical delusions. We become the more careful in deciding on them the longer we examine; *even in glaucoma* the vessels lie in the middle apparently prominent portion of the opticus further from and not nearer to the eye of the observer than those which lie in the level of the retina, as we can easily prove by the increase of distinct definition (in the upright image) when we use stronger concave glasses. I gladly take this opportunity to correct former observations and content myself at present with *raising a doubt* as to the correctness of the observations by myself and others in which it was maintained that the papilla was projecting.

"This doubt on the part of Gräfe appears to have been sufficient to cause the scales to fall from the eyes of the ophthalmologists, and it commenced to become apparent that in glaucoma the papilla was not prominent and projecting, but on the contrary excavated and lying far behind the plane of the retina.

"We must now mention an exceedingly important anatomical observation of H. Müller.⁴ On the 8th of March, before the Physico-Medical Association at Würzburg, he speaks of a case of glaucoma in which an excavation at the entrance of the optic nerve was proved by dissection, and remarks further that this change at the entrance of the nerve was due (as already mentioned by Von Gräfe) to an increase of intraocular pressure. This notice, which should have marked an epoch, which should with a single blow have lifted the veil of doubt as to the essential changes in glaucoma, remained, however, without notice, and in 1857 Förster first showed in a clear and logical manner that all the appearances presented by a glaucomatous nerve may be explained by the existence of an excavation, not knowing H. Müller's anatomical observation, and his clever deduction from it, he remarks that a sinking of the papilla and of the lamina cribrosa in glaucoma are all the more probable since Von Gräfe has maintained that the mechanical cause is to be found in increased intraocular pressure.

"In his famous dissertation *On Iridectomy in Glaucoma and on the Glaucomatous Process*,⁵ Von Gräfe mentions in a few words that the conviction that the glaucomatous optic nerve was not prominent but excavated, had now become firmly rooted, and he comforts those who yet doubt by announcing an

¹ Archiv für Ophthalmologie, tom. i. p. 373. ² Ibid., ii. 1, p. 133.

³ Ibid., ii. 1, p. 145.

⁴ Sitzungs's Berichte, vii. p. 26.

⁵ Archiv für Ophthalmologie, iii. 2, p. 81.

anatomical description of a glaucomatous nerve as about to appear, by H. Müller. If we form our conclusions from the above, it would appear that he did not know that H. Müller had already a year previously published such a description. The promised anatomical observations appeared in the following year (1858), and even the most incredulous must be convinced by the drawings and cadaveric appearances there described. With this the most important contributions to our knowledge of glaucoma were brought to a close, but in 1861 Ed. Jäger¹ made a further valuable addition to our knowledge by his publication of a number of anatomical and ophthalmoscopic drawings of glaucomatous optic nerves."

H. Müller has estimated the depth of glaucomatous excavations at from three-fourths to one mm., but Mauthner has shown by his examination of eyes during life that they sometimes attain double that depth, or, in other words, the average diameter of the normal papilla being 1.6 mm., glaucomatous excavations are often as deep as the papilla is broad.

In treating of the pathological alterations of the retina, Dr. Mauthner, weighing the comparative advantages of an etiological and anatomical classification, has decided in favour of the former, on account of its more practical nature and greater convenience. The retinitides are, therefore, classed as idiopathic inflammations, those forms occurring in consequence of diseases of the kidneys, syphilitic retinitis, retinitis occurring in leucæmia, in diabetes mellitus, and in diseases of the liver. Then follows "typical pigmentary degeneration," as our author terms what is usually known as retinitis pigmentosa, non-typical pigmentary degeneration, separation of the retina, and lastly its atrophy.

The chapter on the choroid furnishes a short *résumé* of the various pathological processes in that tunic; the remarks on staphyloma posticum and on tuberculosis of the choroid are particularly interesting. In his discussion of diseases of the vitreous our author gives an account of the entozoa which have been found in the eye. Up to the present time but few species have been observed in that organ, viz., the *filaria oculi humani*, the *cysticercus cellulosæ*, and certain trematode worms in the lens. The *cysticercus* is unfortunately in North Germany of common occurrence. Gräfe estimates that there is one case in every thousand which come to his clinic. In Vienna it is much less frequent. Dr. Mauthner having no cases of his own to detail, has induced Prof. Becker (now of Heidelberg, formerly of Vienna) to furnish an account of some cases which came under his observation when he was assistant at Prof. Arlt's clinic.

"My observations on *cysticercus* in the eye are confined to the few cases in which this parasite has been found posterior to the lens, at the clinic of the Vienna University. Of these, three lay between the retina and choroid, one in such a position in the retina, that the bladder to a great extent projected into the vitreous. One of the *cysticerci*, which lay under the retina during my observation, changed its position to such an extent that it made its way through a hole in the retina into the vitreous. These four *cysticerci* were found in three individuals and in three eyes—one eye containing two *cysticerci*. Together they constitute the only four which, up to the present time, have been observed in Austria, posterior to the lens. The number is small, and if I nevertheless allow myself to make remarks on the ophthalmoscopic diagnosis of intraocular *cysticerci*, it is with all the reserve which should accompany a so limited material, and in order to oblige Dr. Mauthner, who desires that his book shall have as much as possible the stamp of original observation.

"In all three cases I was led by the peculiar aspect of the retina to suspect the presence of a *cysticercus* and search for it. The retina was for a greater

¹ Einstellungen des dioptrischen Apparats.

or less extent cloudy and grayish-white—not bluish, but little raised, and apparently slightly folded—perhaps only irregularly thickened, so that in many places its surface no longer appeared smooth and even, but grooved. The vessels were, at points corresponding to these elevations, twisted and bent, but filled with blood, and therefore appeared red. In many places they were hidden by small extravasations of blood. Certain dark-gray roundish spots (to which I shall again refer) in the grayish-white retina appeared to me to have a special significance. They lay in the posterior part of the eyeball extending over the region of the macula lutea.

“We may here remark that in no other known disease of the retina do we find similar appearances. In the vicinity of the thus altered portion of the retina we find a genuine separation of that membrane, usually rounded and projecting into the vitreous. This was seated once behind the equator bulbi, above and to the outside of the macula lutea, and twice in front of the equator, in the lower and outer and lower and inner quadrants.

“The circulation of the blood in this bladder-like retinal separation was, to judge by the red colour of the vessel, uninterrupted. Twice one could observe behind the comparatively transparent retina, a somewhat flattened, bluish, circular, and non-vascular cyst, whose convex wall, as it receded from the retina, could be distinctly recognized. The want of vascularity is opposed to the supposition of a tumour, and the diagnosis of a bladder-like worm is already justifiable. When the bladder has broken through the retina we have altogether another picture. A non-vascular blue bladder projects now into the vitreous—of different size—usually having from two to four times the diameter of the papilla, with a finely granular surface and a lively play of colours when strongly lit up. This iridescence is particularly well marked at the edges, the red however preponderates. At some point of the bladder there is a somewhat cloudy but glittering white spot. The bladder remains fastened, as if by a neck, to a portion of the retina, which is degenerated in the manner above described. When any one has repeatedly observed the above-mentioned appearances, and always found them unvarying, he may, I believe, confidently make the diagnosis cysticercus. It would, however, always be the part of prudence not to content one's self with this, but to watch with the utmost attention such a bladder, whether in the vitreous or under the retina, for a considerable time, and to concentrate our attention either on a portion of the edge or in the previously mentioned clouded but bright spot. After a few minutes we will be able to perceive a movement of the edge or of the bright spot at a time when the eye is completely motionless. The bright spot moves in one or the other direction, becomes larger or smaller, and in a short time returns to its previous position, although perhaps altered in appearance or form. If we have fixed our attention on the wall of the cyst, we are able to distinguish in it two kinds of alteration. The contour of the cyst changes, its wall becomes prominent or depressed, and a wave-like motion runs along it, at the same time, the colour changes, blue spots change to white, the white to gray, the iridescence ceases, and in its place we have a peculiar deadened glistening of the surface. The bright spot is the place where the head and neck lie in the receptaculum. No matter how slight the change in the position of either, it is sufficient to cause a trembling of the surface of the entire fluid-distended sac, and the slight motions of the numerous chalky particles in its wall, cause the before-mentioned glistening. Although these phenomena of motion have a great similarity, whether the cysticercus be situated in the vitreous or under the retina, yet the difference in situation gives rise to certain peculiarities. When the cyst projects into the vitreous, the various details are much more easily perceived. When seen behind the retina the colours are certainly less brilliant, but the motions are easier to judge of, inasmuch as the retina, which does not participate, affords us a standard of comparison. In exceptional cases the motions of the cysticercus are so energetic that the superimposed retina moves with it. It is easily understood that we must exercise care not to mistake the motions of a detached portion of the retina, caused by the vibrations of the serous fluid behind it (caused by change of position of the eye), for motions of the cysticercus itself. If, however, we have once clearly seen independent motions of the cyst,

we have proof of the presence of a living foreign organism in the eye, which again *per exclusionem* leads us to the diagnosis cysticercus. The diagnosis is, however, only placed beyond all cavil when we are lucky enough to get a sight of the animal with head and neck stretched into the receptaculum. It happens occasionally that the neck remains for a short time stretched in one position, and the head, with retracted suctorial pores and outstretched rostellum, presents its ornamental garland of hooks, which appear as fine, scarcely-visible, radiating lines, whose presence we rather have a presentiment of than see distinctly. At times we see the neck with comparative rapidity assume all possible curves and positions. Like a swan's neck it becomes thicker and shorter, or longer and thinner, bends towards all sides, turns half on itself, while the head, by the alternate protrusion and retraction of its feeler-like sucking orifices, assumes the most curious and wonderful forms. The suctorial pores resemble to the last degree, the tentacles of the snail, and, like these, by their constant motions present to us a curious spectacle.

"It is, however, as previously remarked, pure chance when we find the head and neck of the animal stretched out. I have only seen it in the first subretinal cysticercus, that observed in 1865, but there repeatedly. It was not only seen projecting through the retina, but also between it and the hyaloidea. (?)

"In this case I had also an opportunity to watch the origin of the previously-mentioned gray spots. At the point where the head remained for any length of time behind and in contact with the retina, a transparent gray spot remained. It appears to me probable that at such points the posterior layers of the retina are destroyed, and only the layer of nerve-fibres remains. It were also possible that the entire retina has been destroyed, and that such a hole is only covered by the hyaloid. At these spots all motions of the animal appear particularly distinct, as if seen through a window. The animal can also protrude its head through it, and then, covered only by the membrana hyaloidea, or by the nerve-fibres, it appears sharp and well defined. In recurring again to the appearance of the retina, I wish to adduce an observation which appears to me to prove that the above-mentioned peculiar appearances of the retina enable us to conclude that a cysticercus has previously lain at this spot, and that here the embryo has developed itself. It was observed once that such a cyst, in the short period of twenty to thirty minutes, worked itself forward several times under the retina. The tumultuous movements which the retina presented are difficult to describe. It was also impossible to see distinctly by what mechanism this change of position was brought about. The motion was so considerable, that the cyst which at the commencement was situated outwardly from the rectus inferior, was, when all was again at rest, on the inner side of the muscle from whence, on the following morning, it was extracted through an incision in the sclerotic. At the place where the retina had only been detached for a few hours, it reapplied itself perfectly after the extraction of the cysticercus, while, where it had lodged the parasite for weeks, perhaps months, it remained cloudy and no longer performed its functions. The vitreous humour showed in all the cases numerous pin-point opacities, collected in small groups. Membranous opacities only developed themselves (and this in the first case) after it had been repeatedly and unsuccessfully operated on.

"Nine months afterwards cataract formed (with comparative rapidity in this eye), and it is now atrophied. It is worth mentioning as a novelty that in the third case observed at our clinic, two cysticeri were present in one eye. On admission one cysticercus cyst was observed with lively motions protruding into the vitreous, and immediately along side of it a half ball-shaped detachment of the retina so opaque that nothing could be seen through it, consequently no motions could be seen behind it. Nevertheless, I pronounced it not improbable that we had here two cysticeri, one free in the vitreous and one behind the retina. After a successful extraction of the first by an incision in the sclerotic, which in this case had also to be carried through the retina, and the wound had so far healed that we could again use the ophthalmoscope, it appeared that through the cut in the retina the second sac had forced its way into the vitreous, and there by its lively contractions gave unmistakable evidence of its being a cysticercus."

Inasmuch as the cysticercus, if it remains alive, after a short residence destroys the eye, the indication is to extract it. To accomplish this Prof. Gräfe employs his peripheric linear cut, and after iridectomy and extraction of the lens, endeavours to cause its exit by means of a curette carefully introduced into the vitreous by a succession of gentle efforts.

Prof. Arlt operates by an incision in the sclerotica from before backwards between the inferior and externus, or inferior and internus, in the direction of one of the great meridians of the eye. When the parasite happens to be lying in front of the equator under the retina, the latter would appear to be much the preferable operation, inasmuch as the patient's power of accommodation is in nowise interfered with.

The writer of this notice, while attending Prof. Arlt's clinic at Vienna, had an opportunity of observing three cases of cysticercus, two of which have been above detailed in the masterly description of Prof. Becker. In all three cases Prof. Arlt attempted to extract it, and in two of them was successful in so doing; in the third the animal was lying free in the vitreous, and he relinquished the attempt in finding that it would be impossible to seize it without violence to the tunics of the eyeball and considerable loss of that humour.

Hoping that by the above extracts we have succeeded in giving to our readers a fair idea of the contents of Prof. Jæger's Atlas and Dr. Mauthner's Text Book, we conclude by cordially recommending them to the attention and perusal of all interested in ophthalmic surgery, believing them well worthy of their careful study.

W. F. N.

ART. XX.—*Injuries and Diseases of the Knee-joint, and their treatment by Amputation and Excision contrasted.* The Jacksonian Prize Essay of the Royal College of Surgeons of England for 1865. By WILLIAM PAUL SWAIN, F. R. C. S., Surgeon to the Royal Albert Hospital, Devonport. 8vo. pp. xii. 252. London: John Churchill & Sons, 1869.

In the year 1860 the subject for the Jacksonian prize essay of the Royal College of Surgeons was announced in almost the same language as in 1865. The prize in the former year was contended for by the late Mr. Price, with what melancholy result we all know. Price's was the only essay sent in, and yet was rejected; the disappointment fell heavily upon the author, whose health was already undermined, and he died of phthisis three or four years later at the early age of 32. His work, posthumously published under the editorial supervision of his friend and colleague Mr. Henry Smith, amply vindicated his fame, and is now deservedly looked upon as classical. Under these circumstances the subject of "The diseased conditions of the knee-joint which require amputation of the limb, and those conditions which are favourable for excision of the joint," was again proposed in 1865, and on this occasion the prize was awarded to Mr. Swain, whose essay forms the neat volume the title of which stands at the head of this article. Mr. Swain's essay was originally published in the *British Medical Journal* for 1866, from the pages of which it is now reprinted with some additions; and it thus comes before the profession for

examination and criticism as one of the excellent series of "Jacksonian prize essays." The body of the work, which is appropriately dedicated to Sir Wm. Fergusson, is divided into ten chapters, the last quarter of the volume being occupied by an appendix giving in more or less detail 104 cases, most of which had not hitherto been made public.

The first chapter is devoted to the "General anatomy of the knee-joint," and describes successively the bones which enter into that articulation and their centres of ossification and growth, the muscles and tendons, ligaments, cartilages, synovial membrane, and vascular and nervous supply of the joint. The author agrees with Barwell in believing that the synovial membrane is not prolonged over the articular cartilage, and that it is, therefore, more properly described as a tube than as a closed sac.

The consideration of the "morbid conditions of the knee-joint" is commenced in Chapter Second, the author describing in succession, acute, subacute, and chronic synovitis, gelatiniform degeneration, rheumatic synovitis, suppuration in the joint, and acute and chronic inflammation of the cartilages. Under the name of *gelatiniform degeneration*, the author describes what is ordinarily called scrofulous or strumous synovitis, but which he justly observes is often present when there is no evidence of any constitutional affection whatever. It is, moreover, almost never met with except in the knee, thereby differing from those forms of synovitis which are habitually connected with the strumous diathesis. This gelatiniform degeneration is usually found among adults. "The swelling, which is the first symptom, is of a peculiar character. It does not convey the sense of fluctuation to the touch, which the ordinary effusions of synovial inflammation do; it is a swelling rather of a doughy, semi-elastic character. Nor does it assume the same form. It is more general and uniform; the bulging of serous effusion is absent, and the whole joint assumes a regular globular shape." Repeated attacks of chronic synovitis, by causing the formation of successive layers of organized lymph, may give rise to a difficulty in the diagnosis, which can, however, usually be made by inquiring into the history of the case, and by remembering that the gelatiniform degeneration, unlike chronic synovitis, is attended by "a constant, dull, heavy, gnawing pain." Even in the advanced stages of pulpy degeneration, the joint retains considerable mobility. These cases almost invariably end in suppuration of the joint and destruction of the articular cartilages, requiring operative interference.

"It is almost certain," says Mr. Swain, "that disease never commences in the articular cartilage." The cartilages become secondarily affected, the disease originating in the synovial membranes or in the bone.

The researches of Virchow, Goodsir, Redfern, and Barwell, as to the inflammatory changes which take place in cartilage, are briefly referred to, and the ulceration of cartilage is divided (following Barwell) into the inflammatory and degenerative varieties, two forms of degeneration being recognized, viz., the fatty and the granular. "The pain and starting of the limb which accompany ulcerations of the cartilage of the knee-joint were at one time referred to the cartilage itself, but are now understood to arise from the exposure of the bony structure by the removal of the cartilage. . . . We may be pretty sure that simple degeneration or ulceration of cartilage will in itself give little or no indication of its presence. When active symptoms show themselves, extensive mischief has already been done in the joint." Severe symptoms supervene more rapidly when

the disease has begun in the bone, than when the synovial membrane is first affected.

The author treats in the third chapter of the diseased conditions of the bones forming the knee-joint, and the tissues surrounding it. Diffuse inflammation of the spongy structure of the bone (acute sub-periosteal abscess) is first referred to, and the occasional occurrence of spontaneous separation of the lower epiphysis of the femur, in this affection, mentioned on the authority of Dr. Klose. "In chronic inflammation there is increased vascularity not of the bone itself, but of the membrane lining the cancelli. On making a section of a bone thus affected, the entire surface presents a uniform dark purple hue, or, it may be, a mottled appearance." As the disease goes on, the effusion of serum is succeeded by suppuration, and finally the lining membrane of the cancelli begins to granulate, the cancelli themselves being absorbed till finally the articular extremity consists of a granular mass surrounded by the external shell of bone. What is often called tuberculous disease of the articular extremities of bone is, according to our author, merely chronic osteitis. "I have never seen," he says, "a case of pure tuberculous deposit in a joint-end; and I believe that the 'gelatinous material' which Price describes as '*in every respect* analogous to pulmonary tubercle,' is nothing more than the granulations filling the cancelli which I have before described."

Under the heading of *Tumours involving the Articular Extremities*, a caution is given as to operations for the removal of exostoses or of cartilaginous growths. These tumours often cause repeated attacks of synovitis, leaving the synovial membrane thickened and dilated, so that in any attempt at removal of the growth, "the joint is very likely to be laid open, and serious mischief ensue." Medullary cancer, or cystic growths, are occasionally met with in the articular extremities of both femur and tibia.

The fourth chapter is devoted to wounds, injuries, and deformities of the knee-joint, and contains many judicious directions as to the general management of these conditions. Free incisions into the joint (as recommended by Mr. Gay) are advised in case of suppuration occurring, together with the continuous application of ice. An attempt should always be made to obtain a cure by ankylosis, though in many cases the destruction of parts will be so great as to require either excision or amputation.

In the fifth chapter the author takes up the subject of excision of the knee-joint, and the ensuing pages are chiefly devoted to statistics. The following table, which we reproduce, embraces only cases operated on by British surgeons, and deals, we believe, with larger figures than any that has yet been published:—

	No. of cases.	Reco- veries.	Deaths.	Ampu- tation.	Reco- veries.	Deaths.
Recorded in Price's book up to 1865	316	240	76	39	30	9
Collected by Dr. MacCormac . . .	74	49	25	11	7	4
Tabulated by Mr. Swain	82	67	15	4	4	0
Total	472	356	116	54	41	13

The mortality of the operation in the hands of British surgeons would, according to these figures, appear to be about $24\frac{1}{2}$ per cent. Mr. Swain compares these results with those derived from the statistics of Dr. Hodges and of Mr. Heyfelder, and attributes the greater success of the operation as shown by his own tables, to the superior skill of his countrymen.

This whole chapter strikes us as rather unsatisfactory ; indeed the author himself considers the statistics of the operation "most unreliable."

We almost wish that our author had omitted all reference to figures, for after all, the recommendation of excision over amputation consists in the fact that the former operation preserves a limb which the latter sacrifices, and not in a fractional difference in the resulting mortality ; we shall, however, revert to this subject in another place.

The "modes of performing the operation of excision of the knee-joint ; and the after-treatment," are presented in Chapter Sixth. The old-fashioned H incision, so highly commended by Butcher and Price, is condemned, and the horse-shoe or U incision described as in every way preferable. The important points to be observed are to place the lateral branches of the incision fairly behind the condyles, so as to insure free drainage ; to which we may add, that if the U incision be used, its transverse branch and curves should be low enough to allow ready exposure of the articulating surface of the tibia. The operation by a simple transverse incision across the joint (the first use of which is by Mr. H. Smith, attributed to Sir William Fergusson), is stated by Mr. Swain to have been previously used by Mr. Kempe, of Exeter. He does not seem to be aware that this plan was originally suggested by Park, in his celebrated letter to Mr. Percival Pott. This method has the advantage over the U incision of making a much smaller wound, and can be readily extended into the H incision, if necessary, by adding short longitudinal cuts. In the use of the saw care must be taken not to strip off the periosteum above the line of section, and to preserve the natural obliquity of the femur. An equal amount must be removed from each condyle, and the saw must be applied perpendicularly to the axis of the femoral shaft, not to that of the patient's body. Fergusson's lion forceps are praised, but Butcher's saw is rather slightly referred to as "neither so firm, nor so entirely at the command of the operator" as the ordinary broad-bladed saw which the author prefers. For our own part, we look upon Butcher's saw as a most valuable instrument ; the facility which it affords for dividing the bone from below upwards, and thus avoiding all risk to the popliteal vessels, amply compensates for any want of stiffness, which deficiency is after all more fanciful than real, for by proper adjustment the saw can be made firm enough for all practical purposes. For the after-treatment of excision cases, Mr. Swain recommends the splint known as Price's (a modification of the ordinary McIntyre's splint), or the suspension rod and Gooch's splint, as advised by Dr. P. H. Watson, either of which our author considers better than the box-splint of Mr. Butcher. The splint being adjusted, the patient is to be placed in bed upon a water-pillow, with the leg suspended by a "Salter's swing." The use of the water-pillow Mr. Swain deems very important. "By it the pelvis is, as it were, swung, and the patient can move about with the greatest freedom, without a single jar being communicated to the limb." To obviate the bowing outwards of the joint, which sometimes occurs after the operation, Mr. Swain has devised a "truss-pad," . . . which, taking its fixed point from a bar attached to the inner side of the splint, passes over the joint, and presses the limb inwards and a little downwards."

In Chapter Seventh the author considers the "diseased conditions in which the operation of excision of the knee-joint is admissible." In deciding upon the propriety of excision, there are three points to be specially considered ; these are (1) the extent and character of the disease, (2) the

constitutional condition of the patient, and (3) the patient's age. With regard to the state of the affected joint, it may be said in general terms, that the operation is not justifiable, so long as the soft tissues of the articulation are alone involved. Excision has occasionally, but very rarely, succeeded in cases of acute suppuration of the joint, and our author agrees with Mr. Holmes, that for such cases amputation is usually a preferable operation. When the cartilages and bones are involved, the patient suffering from the peculiar starting pains characteristic of this condition, our author considers excision to be particularly applicable. Though these cases may sometimes get well without operation, the time required for a cure by ankylosis is a matter for serious consideration. In illustration of this point a case is quoted from Hilton, where a not very brilliant cure was obtained after no less than ten years' treatment.

The existence of circumscribed abscess, or of limited caries, or necrosis, or even of the so-called tuberculous deposit of Price (if in small amount), does not contra-indicate excision. In the diffuse variety of the latter affection, however, amputation would be a safer operation: "If, upon making the section of the bone, large diffuse extravasations of blood be present, or if it present a dirty yellow appearance, from diffuse suppuration, the operation of excision is not admissible."

Continuing the subject of the local conditions admitting of excision, in Chapter Eighth, the author considers the operation as applied for the relief of traumatic injury and deformity. Mr. Swain makes the assertion (which he does not attempt to prove), that the shock of excision is less than that of amputation: he, however, somewhat modifies this opinion on a subsequent page, by explaining that he looks upon *hemorrhage* as a cause of *shock*. No one, we suppose, will be apt to differ from him in believing that more bleeding attends the loss of a limb than the mere loss of a joint; but, on the other hand, we think that the experience of most surgeons will confirm our own, that the shock (*pur et simple*) of an amputation is no greater than, if as great as, that of a corresponding excision. We do not find anything new in this chapter as to the application of the operation under discussion in military practice; nor do we think our author justified, by any facts that he has presented, in "boldly prophesying," as he does, that when British army surgeons have occasion to excise knee-joints, they will meet with "better results than those given . . . by M. Spillmann¹ and the Surgeon-General of the American army." Greatly as we admire the skill of British surgeons, we cannot believe that it will suffice to render an operation advisable, which has been condemned by the general experience of other nations in its application to the surgery of war. In his remarks upon *excision for deformity*, we are rather surprised to observe that Mr. Swain makes no mention of the names of either Dr. Barton, of this city, or Dr. Buck, of New York.

Our author discusses in the ninth chapter "the constitutional conditions and the age admitting excision of the knee," and adds some remarks upon re-excision. "It really seems so reasonable," says Mr. Swain, "that it should be a *sine quâ non* for the patient to be free from any other exhaustive visceral disease, that one is surprised to find surgeons advocating the

¹ By the way, Mr. Swain is in error in saying, as he does on page 122, that "M. Spillman has published . . . the history of thirteen cases of excision of the knee in civil practice, for gunshot injury," the fact being that only four of the thirteen were for gunshot injury, the remaining nine being for other forms of traumatic lesion.—See *Archives Générales de Médecine*, Juin, 1868.

practice of excision when visceral disease is present." With regard to *age*, our author would forbid the operation in children under ten and adults over forty-five. Mr. Swain's remarks as to the arrest of growth consequent upon excision are interesting and judicious: he agrees with Fergusson and Holmes in considering a shortened limb as better than a stump.

Chapter Tenth is devoted to amputation of the thigh, for disease of the knee-joint: the operations recommended are those of Spence and Carden, with the use of ligatures and *non-metallic sutures*. Our author here returns to the statistics of amputation and excision, and we must say, in a very unsatisfactory manner. He reasonably observes that it is unfair to compare excisions *for all causes, with amputations for disease alone* (which are of course the most favourable cases): and yet he immediately proceeds to do what is equally unfair, viz., to compare excisions with amputations of *all parts of the thigh*. The fact is that, as we have already observed, the relative merits of the operation are not to be settled by statistics; for it is almost impossible thus to institute a just comparison. Moreover, as far as statistics show anything, they show, when fairly considered, that excision of the knee is more fatal than amputation through or immediately above the condyles. Thus Hodges' tables give two hundred and eight cases of excision *for disease* performed since 1850, with sixty deaths (a mortality of 28.84 per cent.); while Brinton's statistics of knee-joint amputation *for disease* give a mortality of only 22.58 per cent. Again, taking Mr. Swain's own figures as to the practice of the Exeter and Plymouth Hospitals, we find that the former gives one hundred and nineteen cases of thigh amputation with ten deaths (mortality of 8.40 per cent.) against thirty-one excisions with three deaths (mortality of 9.68 per cent.); while the latter gives forty amputations with three deaths (7.50 per cent.), against eight excisions with two deaths (25 per cent.).

We may add that the adoption of Mr. Swain's advice (which we entirely approve) to reserve excision for those patients who are in the prime of life and unaffected by visceral disease, and to employ amputations for the others, will not tend to make the operations more comparable as to their statistical results. The true question, we take it, as to excision of the knee-joint is this: Are the prospective benefits of the operation sufficient to warrant the surgeon in exposing his patient (in a suitable case) to the additional risk of excision over those of amputation? And this question we are prepared, unhesitatingly, to answer in the affirmative. The surgeon's first effort (where any operation at all is required) should be to save both life and limb by a resort to excision, and it is only when the local or general condition of the patient will not allow the preservation of the limb by the graver operation of excision, that an amputation should be thought of. Knee-joint excision is too valuable an operation to need to be bolstered up by an attempt to prove it in itself less fatal than amputation; but though more fatal, its dangers are not so much greater but that it is in proper cases in every way to be preferred.

We have thus gone hurriedly over Mr. Swain's book, and endeavoured to give our readers a sketch of its general scope and design. It is, on the whole, a good book, though not so good, we think, as it might have been; nor, with all respect to the judgment of the Jacksonian Committee of the Royal College of Surgeons, as good as its rejected predecessor, the work of the lamented Price. We cannot see that Mr. Swain has added a great deal to what was already known concerning the subject of his essay,

but his book is nevertheless useful, as presenting in a form convenient for reference what has been said by others, as well as the results of his own experience.

As a literary effort the work cannot be considered as remarkable, the style being rather common place and occasionally somewhat obscure. The book is well printed, and the wood-cuts (thirty six in number) are usually satisfactory. Though we confess to a feeling of disappointment after the perusal of this volume (perhaps we expected too much on account of its being the Jacksonian prize essay)—we do not wish to appear to undervalue Mr. Swain's work, which we hereby cordially commend to the attention of American surgeons.

J. A., JR.

ART. XXI.—1. *On the Physical Basis of Life.* By T. H. HUXLEY, LL. D., F. R. S. 12mo. pp. 35. New Haven, Conn.: C. C. Chatfield, 1870.

2. *As Regards Protoplasm in Relation to Prof. Huxley's Essay on the Physical Basis of Life.* By JAMES HUTCHISON STIRLING, F. R. C. S., LL. D. Edin. 12mo. pp. 68. Edinburgh and London, 1869.

3. *Protoplasm; or, Life, Matter, and Mind.* By LIONEL S. BEALE, M. B., F. R. S., etc. Second edition, much enlarged, with coloured illustrations, 12mo. pp. 158. London: J. Churchill & Sons, 1870.

4. *How to Work with the Microscope.* By Dr. BEALE. Fourth edition. pp. 308 to 339. London, 1868.

THE first three books at the head of this list should be read together, or rather continuously, in the order of publication. We are quite sure that such perusal, if careful, will reward the reader, by a thorough acquaintance of the history, nature, and properties of protoplasm, such as can be derived from no single one of the three; though we are not so sure that he will know as much more of the real nature of "life" as he might be led to expect from their titles, or the reputation of their authors.

Prof. Huxley's essay, or lecture, was the "glove" thrown to the literary and scientific world, which Dr. Beale and Mr. Stirling have hastened to pick up, though it seems to us that Mr. Huxley has not, in every instance, been properly interpreted by either of these gentlemen. We do not think that either Dr. Beale or Mr. Stirling has sufficiently remembered the character of the audience or the nature of the occasion which called forth Prof. Huxley's essay. The former, as we understand, was promiscuous, and the latter, one of a series of Sunday evening addresses upon non-religious topics. As such, it contains statements which are general and as inaccurate as such statements often erroneously are, when intended for popular appreciation, and should not, therefore, be subjected to the most rigid scientific criticism, unless they are rearranged for scientific readers. Perhaps, had this been the case, certain palpable flaws in the argument of Prof. Huxley would not have occurred.

Prof. Huxley's object is to show, 1st, that there is one kind of matter common to all living beings, which is "protoplasm," the scientific name for the physical basis of life; 2d, that all the phenomena exhibited by protoplasm are simply its physical properties, just as the phenomena exhibited by water in its various states are properties; they are not to be considered

the result of the presence of the principle usually called "vitality" any more than the phenomena exhibited by water should be considered the result of a principle to be called "aquosity." Or the proposition may be more briefly stated thus, *all vital action is the result of the molecular forces of the protoplasm which displays it.* Thus, most strikingly, the thoughts to which we give expression are simple properties, the result of molecular changes in protoplasm.

The proof of the first proposition is based on the assumed fact that notwithstanding the apparent differences in objects so widely contrasted as the microscopic fungus and the wealth of foliage of the great pine of California, as the great Finner whale and the invisible animalcules, multitudes of which could dance on the point of a needle, or the flower in a girl's hair and the blood in her veins, there still remains a unity of *power* or *faculty*, a unity of *form*, and a unity of substantial *chemical composition*. In the first, or in *faculty* and *power*, we have three modes of manifestation of human activity—contractility, alimentation, and reproduction—which are alike manifested by all lower forms of animal and vegetable. In illustration of the seat of these acts is adduced the semi-fluid lining or bag within the wooden case of the sting of the nettle. This transparent semi-fluid lining, containing also innumerable granules, is *protoplasm*, which, when sufficiently magnified, is seen to be in a condition of unceasing activity. Local contractions of the whole thickness of its substance pass slowly from point to point, producing the appearance of successive waves, analogous to the billows of a waving grainfield. But in addition, the granules are driven in relatively rapid streams through channels in the protoplasm, which seem to have considerable persistence. The currents in adjacent parts commonly take similar directions, usually up one side and down the other; though partial currents also exist, taking different routes, often within the twenty-thousandth of an inch from each other. Sometimes opposite streams come in contact, and, after a longer or shorter struggle, one predominates. The cause of these currents is stated to be, apparently, the contractions of the protoplasm which bounds the channels in which they flow, but which are so minute that the best microscopes show only their effects and not themselves. The difference between the powers of the lowest plant or animal, and the highest, is only one of degree, depending, as pointed out by Milne Edwards, on the extent to which the principle of division of labour is carried out.

Second, there exists, also, a *unity of form*, since not alone the sting, but the entire nettle, and other vegetable tissues as well, are composed of masses of nucleated protoplasm. Nor less the animal, since the colourless blood corpuscles, of which both man and animals were originally simple aggregations, are masses of protoplasm.

Third, as regards *chemical composition* of these widely different representatives of living existence, the researches of the chemist also establish a unity, since all forms of protoplasm are composed of carbon, hydrogen, oxygen, and nitrogen, and respond similarly to reagents, so that all protoplasm may be said to be albuminoid or proteinaceous.

The second proposition, that all vital and intellectual acts, so called, are simply the result of the physical properties or molecular changes of protoplasm, Mr. Huxley attempts to prove from analogy. This involves considerations of the *origin* and *fate* of protoplasm. The fate of protoplasm is death, or resolution into its chemical constituents. And this, also, is its origin, a synthesis of its chemical constituents—a recombination of

the oxygen, hydrogen, nitrogen, and carbon of which it is composed. This is accomplished by the vegetable only, since the animal cannot produce protoplasm from the simpler *combinations*, but requires some form of protoplasm, as that of bread or mutton, to convert it into its own protoplasm. Nor can the plant unite the simple *elements*, carbon, oxygen, hydrogen, and nitrogen, but it must have them already compounded in the form of carbonic acid, water, and ammonia. Prof. Huxley sees no vital act in this production of protoplasm from these simple combinations. Although this can take place only in the presence of previously existing protoplasm, the previously existing protoplasm is simply as the electrical spark, in the presence of which oxygen and hydrogen, present in certain quantities, are converted into water. As there is not the slightest parity, but the greatest difference between the properties of the resulting water and the gases from which it was produced, so the properties of protoplasm are not more widely different from the carbonic acid, water, and ammonia whence it was formed.

We still speak of the properties of water, and believe they depend in some way upon the properties of the component elements of water. "We do not suppose that a something called 'aquosity' entered into and took possession of the oxide of hydrogen as soon as it was formed, and then guided the aqueous particles to their places in the facets of the crystal (of ice) or amongst the leaflets of the hoar-frost." Now, "vitality," according to Prof. Huxley, has no better philosophical status than "aquosity," and should hope for no better fate than the other "itys" which have disappeared since Martin Scriblerus accounted for the operation of the meat-jack by its inherent "meat roasting quality," and scorned the materialism of those who explained the turning of the spit by a certain mechanism worked by the draught of the chimney. Nor is there any logical halting place in Prof. Huxley's mind, between the admission that such is the case, and the further concession that *all vital action* is the result of the molecular forces of the protoplasm which displays it.

Prof. Huxley admits that these are "materialistic terms," and that he purposed to lead us through the territory of vital phenomena into a "materialistic slough;" but asseverates most emphatically that he is no materialist, but, on the contrary, he believes materialism to involve "grave philosophical errors." He then proceeds to prove that such a union of materialistic terms with a repudiation of materialistic philosophy is "not only consistent with, but necessitated by, sound logic." His argument is complicated and discontinuously stated, but we have carefully studied it, and think it reduces itself to this: It follows as a result of the progress of science, that every act is the result of a material and necessary cause, or, in other words, there are no spontaneous acts. Now this material and necessary cause, or "matter," is nothing but "a name for the unknown and hypothetical cause of states of our own consciousness." "Spirit" (or vitality), the extinction of which by "matter" is so dreaded, is also but "a name for an unknown and hypothetical cause, or condition, of states of consciousness." Hence both "matter" and "spirit" are but names for the same unknown cause, the existence of which, after all, is simply inferred from human experience, since the law of gravitation, which is truly an "iron" law, and involves the "dire necessity," that a stone, unsupported, must fall to the ground, amounts merely to this: "That in all human experience, stones have fallen to the ground under these conditions; that we have not the smallest reason for believing that any stone so circumstanced will not fall to the ground; and that we have, on the contrary,

every reason to believe that it will so fall." It is simply convenient to indicate that these conditions have been fulfilled by calling such statement "a law of nature." And it is only when we substitute the word *must* for *will*, the word *necessity* for *fact*, which is *law*, that we assume the materialistic position which "is as *utterly* devoid of justification as the most baseless of theological dogmas." (p. 33.)

The result of all of which seems to be, that 1st, every act is the result of an unknown material cause; 2d, "matter" and "spirit" are both names for this unknown cause; 3d, this unknown cause resolves itself into a convenient expression for constantly recurring facts, which, though they do thus constantly recur, are not the result of "necessity," and so long as we do not submit to this idea of necessity, so long do we avoid the shoal of materialism—that is, *every act is the result of constantly recurring facts*.

We do not think it requires great acuteness to perceive that these propositions prove nothing, and we are not a little surprised that so acute an observer as Prof. Huxley should construe them as proving his position.

As to *terminology*, upon which Mr. Huxley lays so much stress, what matters it whether the author of a misdeed considers himself a villain or a philanthropist, the nature of the *act* is unchanged.

But it is due Prof. Huxley also, that we notice what he says in conclusion: first, that the order of nature is ascertainable by our faculties to an extent which is practically unlimited; second, that our *volition* counts for something as a condition of the course of events. (p. 34.)

Thus we have a combination of truth and error which is truly remarkable; and we cannot but hope from these sentences last quoted that Prof. Huxley's mind at bottom is all right, whatever may be the result of his argument.

2. Mr. Stirling's essay was originally delivered in substance as a lecture, at a conversazione of the Royal College of Physicians of Edinburgh, on April 30th, 1869, and is based on the most recent German physiological literature, as represented by Rindfleisch, Kühne, and especially Stricker, with whom, in the production of his "Handbuch," is associated every great histological author in Germany.

The first eleven pages are devoted to an exposition of the method and manner of Prof. Huxley's essay, which is described as an attempt to establish, not by any complete and systematic induction, but by a variety of partial and illustrative assertions, the two propositions above presented, in both of which the agent of proof is this same alleged material basis of life, or protoplasm. The first proposition is that all animal and vegetable organisms shall be identified in protoplasm; and the second, that a simple chemical analogy shall assign intellect and vitality to the molecular constituents of the protoplasm, in connection with which they are at least exhibited. (p. 11.)

Mr. Stirling heartily concurs with Prof. Huxley in all the latter utters in disparagement and contempt of Auguste Comte, but demurs to his opinion that "the new philosophy" has been confounded by the Archbishop of York with the positive philosophy of M. Comte; since Mr. Stirling holds that the school to which Huxley belongs, at least on the philosophical side, is notorious for its prostration before M. Comte, whom, especially so far as method and systematization are concerned, Messrs. Buckle, Grove, Bain, and Mill, members of the same school, regard as the greatest intellect since Bacon. (p. 4.) He holds, also, that their estimate of M. Comte is a valuable element in the estimate of themselves.

Following these pages is a brief but happy sketch of the historical progress of the physiological cell theory, in order that we may learn what is protoplasm. Having wholly grown up since John Hunter wrote his celebrated work, *On the Nature of the Blood*, &c., it assumed a first stage in Schwann's labour and what surrounded it, and was raised to a second stage through the wonderful ability of Virchow. The dissolution or resolution of this second stage has led to the emergence of the word Protoplasm. The first step in the resolution of this theory, the *elimination of an investing membrane*, was completed by Max Schultze, preceded by Leydig. Such a membrane may, and does ultimately form, but when the cell first appears, it is naked. The second step was the elimination, or at least *subordination* of the *nucleus*, which was due to Brücke, preceded by Bergman, also aided by Max Schultze, Kühne, Haeckel, and others. The nucleus is not now to be considered as necessary either to the division or existence of the cell.

Thus, stripped of its membrane and relieved of its nucleus, there remains nothing but what *was* the contained matter, the intra-cellular matrix or "contents," and this is Protoplasm. Mr. Stirling does not omit to allude to Dujardin's discovery of *sarcodæ*, and the introduction of the term "protoplasm," as the name for the layer of the vegetable cell lining the cellulose wall, and inclosing the nucleus. Remak extended the term to the corresponding part of the animal cell, but Max Schultze finally gave the term protoplasm its present position by extending it to include the intra-cellular matrix or "contents," and identifying the substance itself with the sarcodæ of Dujardin.

At the outset, Mr. Stirling does not believe that Prof. Huxley is correct in his conception of the nature of protoplasm, which, according to the latter, is simply a living albuminoid substance—a *living* clay or "life stuff"—out of which is moulded the whole organic world. Mr. Stirling would only consider protoplasm as contained in cells, and not "as so much matter in a pot, an ointment box, any portion of which, scooped out in an ear picker, would be so much life-stuff, and, though a part, quite as good as the whole." The former is the view of even the most innovating of the Germans; *omnis cellula e cellula* is still the rubric upon which they work. The heart of a turtle is not the turtle, nor is protoplasm shred a protoplasm cell. The progress of Prof. Huxley's physiology would thus substitute for cells a single matter of life: as there is a single matter clay which is the matter of bricks, so there is a single matter protoplasm which is the matter of all organisms.¹

But, says Mr. Stirling, the answer to the question "Of what are you made?" by the great mass of human beings who are supposed to be civilized, has long been "dust," and the same dust has been allowed to constitute us all, though materialism has not been the irresistible result, since not so much attention has been paid to the dust as to the "potter" and the "artifice" by which he could so transform it.

Then taking up Prof. Huxley's argument in proof of the first proposition, that all vegetable and animal organisms are composed of the same substance, protoplasm, as based upon unity of faculty, unity of form, and unity of substance, he shows that even should we grant the latter, allotropy must still produce no inconsiderable variety, since ozone is not antozone, nor oxygen either, though in chemical composition all are alike.

¹ See also Huxley's paper on Bathybius "On some Organisms," &c., *Microscopical Journal*, Oct. 1868.

Again, varying proportions of the same elements produce various results, seen in the difference between albumen, gluten, &c., on the one hand, and urea and uric acid on the other, all containing C, H, O, and N. Finally, all protoplasm is not identical in chemical composition, nor do these four constitute the only elements, since muscle and bone are by no means identical, and since other elements, as chlorine, sulphur, phosphorus, soda, potassa, and lime, also enter into the composition of tissues. Vast differences vitally must be legitimately assumed for tissues so widely different chemically.

Here we feel almost disposed to come to Prof. Huxley's rescue. We can scarcely believe it possible that, when he asserts the unity of chemical composition of protoplasm, and that all organized tissues are protoplasm, he should intend anything but the reproducing part of bone and muscle and other organized tissues. Should this be the case, it would be necessary to prove not merely the non-identity in chemical composition of the tissues or even of cells themselves, but of the germinal matter or reproducing part of cells. Now the difference in chemical composition of the entire cell has been satisfactorily shown by the German physiological chemists, since some are shown to contain glycogen, some cholesterin, some protagon, and some myosin, but we are not aware that the nuclei of cells when present, or the germinal matter of different cells, has been shown to differ in chemical composition, though observations have also been made which show the possibility of determining the question.¹ Nowhere, however, does Prof. Huxley make any such distinctions between the reproducing and non-reproducing part of any tissue, and we must admit, a strict interpretation of his words would not permit such a distinction; while this conclusion is further justified by the fact, that if such a division of the matter of muscle into reproducing and non-reproducing portions be made, we must admit the residence in the former of a quality or property analogous to that which is termed by the vitalists "vitality." We hope Prof. Huxley will take an early opportunity to define his position precisely on this point.

With regard to *reagents*, Mr. Stirling's objection is well taken, since, as he states, the researches of Kühne and Max Schultze have shown, instead of a unity, the widest difference in this respect. Though as to *structure*, we have elsewhere stated that we believe protoplasm is as often granular, as described by Prof. Huxley, as it is structureless, according to the description of Max Schultze.

Finally, as to unity of *function*, Mr. Stirling shows that, as in the case of white blood corpuscles, some protoplasm is of unknown and vagrant use, some produces pepsin, some fat, some contains pigment, others not. While there is, in truth, nerve-protoplasm, brain-protoplasm, bone-protoplasm, muscle-protoplasm, and protoplasm of all other tissues, which produces protoplasm of its own kind and only of its own kind.

These are examples of Mr. Stirling's reasoning, which on the whole we consider soundly based on well-observed and confirmed facts. It is therefore highly deserving the careful study of all interested in the controversy pending between the representatives of the two great schools of physiology. To condense it in these pages would impair its strength and symmetry.

3. The principal object of Dr. Beale's little volume may also be said to be to combat the physical doctrine of life as held by Prof. Huxley, Prof.

¹ Brunton "On Chemical Composition of Nuclei of Blood Corpuscles," *Journ. Anat. and Phys.*, Nov. 1869.

Owen, Mr. Grove, Prof. Tyndall, and others. With his characteristic energy, the author defends his own views and points out the weak points of his opponents, chiefly, and as we think correctly, locating the error of the latter in their totally ignoring facts, which, if considered, are quite irreconcilable with their ideas of the phenomena of life.

Dr. Beale's objection to the word "protoplasm" is scarcely consistent with his use of it in his title. Whatever may have been the different uses of the term, we believe its application at present to be quite generally restricted to the producing and reproducing part of the cell; in other words, to the germinal matter of Beale, and although we prefer the latter term, we like also the former in certain associations, as its present use by Dr. B.

In part I., in alluding to Prof. Owen, he makes a strong point when he says Prof. Owen forgets that, although you can unmagnetize and remagnetize the magnet at pleasure, if you kill the amoeba once, it can never be revitalized. And, in reply to the answer of Prof. Owen, that "there are organisms (*Vibrio*, *Rotifer*, *Macrobrotus*, &c.) which we can devitalize and revitalize—devive and revive—many times," he is equally correct in denying that such organisms are dead; that although they can be *revived*, they cannot be *revitalized*. So with regard to Mr. Grove, who says that "in a voltaic battery and its effects," we have "the nearest approach man has made to an experimental organism," Beale says truly that "voltaic batteries do not grow or multiply, nor do they evolve themselves out of structureless material; nor if you give them ever so much pabulum in the shape of the constituents from which they are made, do they appropriate this."

Dr. Beale is almost bitter in his denunciations of Prof. Huxley, whom he accuses of having indulged in adroit "word-tricks" and inapposite illustrations. In illustration of which he quotes certain writings of Huxley, as his "Lectures to Working Men," and the article in the first number of the "Academy" entitled "Science and Philosophy." Yet we do not think there is anything so enormous in the statement of Huxley that "beast and fowl, reptile and fish, mollusk, worm, and polypi" are composed of "masses of protoplasm with a nucleus." Mr. Huxley undoubtedly means here that in the original condition these organisms were thus composed, just as he says in the same essay that "in the earliest conditions of the human organism, in that state in which it has just become distinguishable from the egg in which it arises, it is nothing but an aggregation of such corpuscles (white blood corpuscles)" not the cuticular corpuscles of the skin as is interpreted by Beale. Dr. Beale, however, justly objects to Mr. Huxley's making no distinction between the powers of the different parts of the cell, since it is not all muscle (protoplasm of Huxley) which has contractility, nor all nerve tissue which has neurility, properties which are indeed comparable to "aquosity," but there is an additional part, the real protoplasm, which possesses the property of reproducing itself and of producing those parts which have contractility. This something is what is often called "vitality," which may be said to be really analogous, not to "aquosity," but to heat, light, and electricity, though Dr. Beale even denies this. It is still, however, something widely different from either. In this we have Dr. Beale's, and, indeed, every vitalist's strong ground against Huxley and his school, rather than against the language of the latter, which, though it mislead the incautious, cannot have any weight with the really thoughtful.

Mr. Herbert Spencer's statement in "Principles of Psychology" that

"in the protogenes of Professor Haeckel there has been reached a type distinguishable from a fragment of albumen only by its finely granular character," is promptly disposed of by the fact that a solution of albumen carefully evaporated and examined by the microscope would also show a "finely granular character."

We pass over the part of Dr. Beale's book which gives his views upon the structure and formation of the simple tissues, merely referring our readers to it as the latest expression of these views, well illustrated, but not essentially different from what we have at different times presented in this Journal.

Dr. Beale believes from a careful consideration of the facts that the serum of the blood is the pabulum; that the red corpuscles are concerned in its distribution, and in preventing changes in the composition of the great mass of the blood, as certain constituents are removed from it or poured into it; and that the white corpuscles are masses of germinal matter concerned in the formation of the serum, as well as of the red corpuscles.

This proposition he bases upon these points: 1st. That fibrous tissues, shell, cartilage, muscular and nervous textures are formed with wonderful rapidity in many lower creatures quite destitute of a fluid containing red corpuscles, but containing a substance closely allied to the albumen of serum, if not identical with it.

2d. That in man and the higher animals the development of tissue corresponds to the period of life when the blood is not remarkable for the number of red corpuscles.

3d. That certain morbid growths appear and increase rapidly in places where the blood has for some time contained a small proportion of red blood-corpuscles. (pp. 97, 98.)

The chief addition to the second edition consists in a chapter on Mind, preceded by a consideration of Nerve Action in general. According to Beale, the finest peripheral nerve fibres are always associated with masses of germinal matter distributed throughout their course, and which are more abundant in the terminal portions. He very properly, however, believes that the only certain evidence of such nerve fibres in a tissue, consists in our being able to trace their continuation with undoubted dark bordered fibres.

The *nerve current* is considered as resulting "in a great measure from changes occurring in the germinal matter of the nerve centres, or more probably in the chemical compounds immediately formed by it; and the masses of germinal matter in the peripheral nerve organs most likely give origin to feeble currents in much the same way. In disease, the intensity of the currents formed at the periphery of the nerves is probably increased." With regard to the nature of the nerve current, we were much surprised to read his statement, "Surely the evidence is strongly in favour of the view that the nerve current is electricity, and I think that most, if not all, the phenomena familiar to us may be explained upon this view." This is further confirmed by the following note on page 128:—

"It is a source of regret to me, that my friend Dr. Child should have so mistaken my views upon this matter, as to tell his readers ('Essays on Physiological Subjects,' second edition, p. 277) that I look upon nerve force as a form of vital force, which is a view contrary to that which I have taught for the last twenty years."

Yet on page 358 of the "How to Work with the Microscope," fourth edition, 1868, we read :—

"Let no one, therefore, conclude that anything is gained by regarding nerve force as electricity, or some mysterious unknown correlative of ordinary force, of the nature of which we know nothing. If we admit it to be ordinary electricity, the problem is not solved; for it is obvious that its manifestations are due entirely to the peculiar arrangement of the nerve cells and fibres which constitute the mechanism for setting free and conducting the currents. It is not possible to conceive nerve phenomena without a special nerve apparatus, and it would be absurd to ignore this apparatus in considering the nature of nervous action. The action of the machine cannot be disassociated from its construction. But the construction of the apparatus and its maintenance in a state fit for action are due to vital power. The lowest, simplest, and least varied kinds of nerve action, like all other actions known in connection with the living elementary parts of living beings, are intimately connected with *vital* changes, and cannot be accounted for by physical and chemical laws only. When we ascend to the consideration of the higher and more complex nervous actions, we find reasons for concluding that the vital actions perform a still more important part."

Surely the language of this latter quotation is not compatible with the former. For ourselves we prefer the latter, as on the one hand more consistent with the vital theory of life, and on the other on account of certain well-marked characteristics which distinguish the nerve current from electricity. Thus the nerve current travels much more slowly than the electrical current; the researches of Helmholtz showing that it travels little more than 200 feet per second in man and warm-blooded animals, while the electrical current passes along a metallic wire at the rate of 462,000,000 feet per second. 2d. Nerve currents are influenced by stimuli, chemical and mechanical, in the course of the nerve, whereas the electrical current is not so influenced. 3d. Undue excitement exhausts neurility, whereas any amount of use does not impair the conducting power of an electrical wire, provided the electrical fluid be produced and the circuit completed. 4th. Neurility disappears ultimately with the life of the part, though it may remain for some time after death. 5th. Disuse diminishes and finally destroys neurility of a nerve, whereas the electrical current may be revived at pleasure by the proper agents. 6th. According to recent observations of Dr. Radcliffe, increased electrical tension suspends muscular and *nervous* action, while these actions are always attended by diminished muscular tension.¹ For these reasons we still prefer to regard neurility as something peculiar to nerves, a *vital property*, or form of vital force inherent and depending upon "*life*" for its existence.

The pages on the nature of mental action are full of interest, yet they could not be understandingly presented in the space allotted us. We would therefore refer the reader to the original volume, where the subject is well mapped out, and as clearly treated as is possible for this class of subjects. We confess we are more fond of Dr. Beale in his descriptions of structure and formation, than in these speculations necessarily based on a limited number of facts.

To those interested in the phenomena of life and organization, as should be every medical man, Dr. Beale's new book will be a valuable if not indispensable contribution.

J. T.

¹ Carpenter's Physiology, 7th edition, page 542, note.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXII.—*Bellevue and Charity Hospital Reports.* 8vo. pp. 415. New York: D. Appleton & Co., 1870.

THE appearance of this volume has been for some time looked for with much interest; as the Profession have been well aware for more than two years that the medical staff of the Bellevue Hospital were preparing for publication the first of a series of Reports similar to those issued from many of the London hospitals, and the medical community were prepared to give it a hearty welcome, and nowhere more so than in this city. Whether or not this volume fulfils all the anticipations that were formed of it our readers will be able to decide from the analyses which we shall give of the papers; we cannot, however, forbear expressing disappointment that of all the eminent physicians who are attached to the hospital only Drs. Flint and Hammond, and the gentlemen who make the Report of the Pathological Department, have thought it worth while to contribute papers. A volume of hospital reports professes, to a certain extent, to be the exponent of the views and practice of the different members of the medical staff, and this is scarcely the case in a book where so large a part of the purely medical papers has been furnished by one gentleman.

The first paper in the volume contains an account of the origin and growth of the present hospital, most of it being taken from an address delivered by Dr. B. W. McCready at the opening of a new wing in 1857.

The following statement is taken from the annual report for the year 1868, and exhibits the capacity of the hospital, and the results of treatment:—

The number of patients remaining in hospital Jan. 1, 1868, was	691
The number of admissions during the year, was	5800
The number of births during the year, was	594
Total number of patients during the year	7085
The number of patients discharged, cured or relieved during the year, was	5597
The number of deaths during the year, was	795
	6392
Total number of patients remaining in hospital under treatment December 31, 1868	693

We shall first call attention to the medical papers—

Art. II. *On the Analytical Study of the Pulmonary Physical Signs furnished by Auscultation and Percussion*, by AUSTIN FLINT, M.D.—The special object of this paper is stated to be “That the differential characters, by means of which the signs severally may be recognized and discriminated from each other, shall have been rendered as distinct, simple, and reliable as possible.” As many of the views expressed in it are to be found in Dr. Flint’s work on “Diseases of the Lungs,” we shall only indicate those which strike us as peculiarly the author’s. In speaking of pectoriloquy he says that attention to the pitch of the sound will frequently enable the auscultator to say whether it comes from a cavity or from the bronchial tubes. “If,” he says, “the transmission of speech be accompanied by the characters of bronchophony, namely, elevation of pitch and proximity to the ear, the pectoriloquy is bronchophonic; it may be due simply to solidification of the lung. If, on the other hand, the trans-

mission of speech be not associated with these characters of bronchophony the pectoriloquy is cavernous." By attention to the same points the bronchophonic whisper may be distinguished from the cavernous. An elevation of pitch is also said to indicate that rales proceed from a considerably solidified lung.

Art. VI. *On the Diagnostic Characters, Mechanism, and Pathological Significance of the Mitral Direct or Obstructive Cardiac Murmur, and on the Occurrence of a Tricuspid Direct Murmur*, by AUSTIN FLINT, M.D.—Dr. Flint is inclined to believe that mitral obstruction more frequently gives rise to a murmur than is generally admitted. The murmur precedes the systole and generally ends with the first sound, being, as it were, suddenly cut short. The quality of the sound is rough, not soft, as he thought at the time he published his book on Diseases of the Heart, and a very good idea of the character of the sound he thinks is given by the word *blubbling*. "The lesion," he says, "which especially gives rise to this murmur is the union of the mitral curtains so as to cause the button-hole contraction, the curtains remaining flexible. In this form of obstruction, the mitral curtains, on their auricular aspect, present a funnel-shaped space, the communication with the ventricle being through a slit, which is more or less narrow. Under these circumstances, the current of blood forced through the aperture by the contraction of the auricle, throws the flexible curtains into vibrations, as the lips or the tongue may be made to vibrate by the current of expired air." The occasional occurrence of the murmur in cases where no mitral obstruction is found after death, but in which aortic regurgitation has existed during life, is thus explained. "Assuming that free aortic regurgitation takes place, the quantity of blood returned into the left ventricle, immediately after the systole, may be sufficient to float and bring together the mitral curtains, an effect of filling this ventricle with liquid, as shown by the physiological experiment of injecting liquid into it from the left auricle. At the time of the auricular contraction, then, the ventricular cavity already containing considerable blood, and the mitral curtains being in apposition, the mitral direct current throws the latter into vibration as the lips are made to vibrate with the expired breath, and the murmur is produced."

Dr. Flint records a case in which in addition to the signs of mitral disease, a murmur was heard at the ensiform cartilage and to the right of the latter, and in which after death a button-hole contraction of the tricuspid orifice was found.

Art. VII. *On the Mode of Obtaining the Venous Hum and the Value of this Physical Sign*, by AUSTIN FLINT, M.D.—The occurrence of the venous hum, Dr. Flint regards as the infallible evidence of the existence of anæmia, and he places more reliance upon it than the pallid condition of the external integument or of the mucous membranes. We were, however, somewhat surprised at the statement which he makes that he was led accidentally to discover that the murmur is generally most distinctly, and sometimes only heard when the head of the patient is strongly inclined away from the side examined. We have heard this fact so often alluded to and have seen it so often demonstrated that it is rather remarkable that it should be unnoticed by some of the authorities on auscultation. Attention has been called to it by Dr. Davies, and in the excellent Manual of Barth and Roger, 5th edit. p. 512, we find the following, "*Généralement, le murmure est d'autant plus fort que le col est plus tendu, la tête plus renversée en arrière et plus inclinée du côté opposé à celui que l'on ausculte; il diminue, au contraire, et même peut disparaître si les muscles du cou sont dans le relâchement ou si la tête est penchée sur la poitrine.*" A similar statement is to be found in Newbigging's translation published in 1842.

Art. IX. *A Clinical Report based on an Analysis of one hundred and two cases of Bright's Diseases of the Kidneys*, by AUSTIN FLINT, M.D.—This is decidedly the most valuable of Dr. Flint's contributions to the volume, and one which we think will prove of great value to all engaged in the study of diseases of the kidneys, but it is unfortunately of a character which does not admit of condensation, and we can therefore only indicate its importance and interest.

The points of inquiry are managed under the following heads: 1. Morbid appearances after death; 2. Fatality and cases of recovery; 3. Antecedent circumstances and previous history; 4. Symptoms and complications; 5. The

progress and duration of the disease, together with the immediate causes of death; and 6. The treatment.

It will be observed that Dr. Flint has adopted as the title of his report, "Bright's Diseases of the Kidney," in this respect following the example of Dr. T. Grainger Stewart.

Art. XII. *Report of the Pathological Department of Bellevue Hospital*, by J. W. SOUTHACK, Jr., M.D., E. G. JANEWAY, M.D., and FRANCIS DELAFIELD, M.D.—This report contains particulars in regard to 277 autopsies made at the Bellevue Hospital between June 16th, 1866, and October 8th, 1867.

The following is the classification adopted :—

- I. Brain and spinal cord with membranes.
- II. Heart and vessels.
- III. Larynx, trachea, lungs, and appendages.
- IV. Œsophagus and alimentary tract.
- V. Liver and spleen.
- VI. Kidneys.
- VII. Genito-urinary organs.
- VIII. Bone.
- IX. Cholera.

Art. XIII. *On some Effects of Excessive Intellectual Exertion*, by WILLIAM A. HAMMOND, M. D., etc. etc.—There is every reason, Dr. Hammond says, to believe that during great mental activity, an increased amount of blood flows through the cerebral vessels, which induces, if the condition be a prolonged one, over distension of the vessels, and profound interstitial changes. The symptoms of course depend, to a certain extent, upon the stage of the disease. Among the most prominent in the stage of congestion and over-distension of the blood-vessels is wakefulness, and this will frequently be for some time the only symptom from which the patient suffers. Before long, however, there will be added to it some confusion of ideas, some loss of memory in regard to recent occurrences, indecision, a loss of the power of concentration, and illusions, which are frequently, however, recognized as such. Among the physical symptoms, vertigo, heat, pain, fulness of the head, and occasionally noises in the ears, and flashes of light are complained of. An ophthalmoscopic examination will generally show the vessels of the retina to be enlarged. Together with the above symptoms there is more or less loss of motion and of sensation, and sometimes difficulty of articulation.

When the brain has become impaired in its nutrition the symptoms indicate great rapidity of the action of that organ, at the expense of strength and completeness, just as a weak heart beats with great frequency and but little force. Thus it is not uncommon to see patients displaying great cerebral activity who are incapable of intense thought, subjects being taken up and then dropped without being thoroughly mastered, and this fickleness is also shown in the ordinary pursuits of life. The special senses are more or less impaired, and so is the motorial, an action necessitating long-continued muscular contraction being impossible. The retina, if an ophthalmoscopic examination be made at the time, will be found to be anæmic.

The treatment will be without avail if the importance of entire rest be not duly impressed upon the patient. Travel, where circumstances permit it, will generally be of service. Bromide of potassium, the property of which, to diminish the amount of blood in the brain, may be inferred from the property which it has of rendering the retina anæmic, is of service. Strychnia and phosphorus should also be given, and are especially indicated where there is evidence of nutritive changes in the brain, and the same remark is true of cod-liver oil. In addition to these remedies Dr. Hammond says: "Great benefit is to be derived from the prudent use of the primary galvanic current, both in contracting the diameter of the bloodvessels, and in improving the nutrition of the brain. To produce the former result, the positive pole should be applied over the sympathetic nerve in the neck, and the negative to the nucha. The same effect is also caused by placing one pole over each mastoid process, and thus passing the current directly through the brain; the instant the circuit is closed in either case, but especially in the latter, a feeling of vertigo is expe-

rienced. If the retina be viewed with the ophthalmoscope at the time, the vessels will be seen to become smaller and less numerous. The employment of the current so as to improve the nutrition of the brain is best effected by placing one pole on the nape of the neck and the other on the forehead. Not more than sixteen elements should be used, and care must be exercised even with this number that the passage of the current be stopped as soon as the least sign of fatigue is experienced.”

J. H. H.

Eight of the fourteen papers contained in this handsome volume are more or less distinctively of surgical interest, and to them we shall now invite the attention of our readers.

Art. I. *On Amputation of the Cervix Uteri in certain forms of Procidencia, and Remarks on the Complete Eversion of the Cervix Uteri*, by ISAAC E. TAYLOR, M. D., etc. etc., is a paper of sixty-seven pages, and is illustrated with seventeen wood-cuts, and a moderately good lithographic plate. Dr. Taylor goes very fully into the literature of his subject, and describes the various operations which have been proposed for the cure of the distressing affections to which his paper refers. He gives details of a number of cases, each of considerable interest, and sums up the results of his investigations in the following “Conclusions,” which we quote in full, and which may serve as a fair specimen of the author’s style:—

“1. That the opinion of M. Huguier—that the affection designated under the names of prolapsus or procidentia of the uterus, and which appears to be completely out of the pelvis [*sic*], and is exterior to the vulva, is rare—is correct, though not as frequent [infrequent?] as M. Huguier supposed, being in the proportion, according to my own investigations, as 1 to 12½, instead of 1 to 32 of M. Huguier.

“2. That there exists very seldom a true hypertrophic elongation or pathological change of structure of the supra-vaginal portion of the cervix; but that there is an elongation which, in a great many cases, varies from 1 to 4, 5, and 6 inches, though usually 4½ to 5.

“3. That the elongation is principally in the *isthmus* or intermediate part of the supra-vaginal portion of the cervix, and that this elongation is aided and sustained by the gravity of the cervix consequent, in a great measure, on the changes which have occurred during gestation or parturition.

“4. That the assertion of M. Huguier—that the fundus of the uterus remains in the pelvic cavity as high as the superior strait or superior part of the symphysis [*sic*] pubis generally—is not verified; but that the fundus or body of the uterus is usually found retroverted or retroflexed, with the cervix in part external, or, as it is not infrequent, the uterus is procident, and retroflexed *in toto* externally.

“5. That the infra-vaginal portion of the cervix is sometimes hypertrophied; but that it is in many instances a true and *complete eversion* of this part, measuring from 2½ to 3½ inches.

“6. That it is not necessary to remove as large a conical part of the cervix as described by M. Huguier; but the simple circular method will, in some cases, suffice, though, in other cases, the adoption of the other methods, as proposed, may be resorted to, according to the nature of the case.

“7. That the only operation which fulfils the principal and correct indications in *this affection*, for the radical cure of this affection, is the amputation of the cervix uteri.

“8. That the contraindications of M. Huguier, which have been referred to, do not forbid the operation, but require it.

“9. That, to obtain a more perfect success in the treatment, the operation of episio-perineoraphy¹ should be performed.”

¹ *Episioraphy* (Fricke’s operation) consists in removing strips of mucous membrane from the labia, which are then brought together with sutures; *Episio-perineoraphy* (Baker Brown’s method) is a modification of the former operation, the incisions being extended on the perineum [pp. 37–38].

Art. III. *On Entire Excision of the Os Calcis*, by F. A. BURRALL, JR., M. D., etc., is a paper of considerable interest, giving a table of 49 cases, in all but one of which the entire bone was removed. Of the 48 cases of complete excision, 33 recovered, 4 died, 7 required subsequent amputation, and 4 were still under observation when the report closed. Dr. Burrall advises complete extirpation except where the disease is very limited in extent, under which circumstances partial excision or gouging may suffice. The best operative procedure is that recommended by Mr. Holmes, in which "a horizontal incision is made from the inner edge of the os calcis, severing the tendo Achillis and going down to the bone, to midway between the heel and the projection of the fifth metatarsal bone, where the calcaneo-cuboid articulation is situated. A vertical excision [incision?] leads from the extremity of the first to just within the sole, stopping short of the grooved internal surface of the os calcis where the vessels lie. The flap thus formed is dissected back, the calcaneo-cuboid joint opened, and the attachments of the bone to those adjacent severed." Dr. Burrall justly lays stress upon the importance of the after-treatment, for which the indications are "perfect rest of the part [by means of a plaster of Paris bandage], a free exit for discharges, and the support of the patient's strength."

This paper (which has evidently been prepared with a good deal of care) would fill a gap in surgical literature, had it not been anticipated by the very exhaustive memoir of M. Polaillon, which was published in the numbers of the *Archives Générales de Médecine* for September and October, 1869, and of which a brief abstract appeared in the quarterly summary of this Journal for January, 1870, pp. 264-266.

Art. IV. *On the Serious Consequences which result from the Neglect of Slight Injuries of the Ankle-joint. Illustrated by Cases*, by LEWIS A. SAYRE, M. D., etc. etc.—This paper, which is in the form of a clinical lecture, is of considerable interest, and may, we think, be profitably read by surgeons. Dr. Sayre commends very highly the use of a seton of oakum as an application to carious joints and sinuses, and gives the details of six cases in which he has used this mode of treatment in dealing with carious ankle-joints, the disease in each instance following upon a sprain or other injury which at first caused but little anxiety. Dr. Sayre first gouges out with a strong, wedge-shaped, and rather dull knife, all the carious bone and disintegrated tissue that can be reached through the various sinuses, carefully preserving the periosteum, and then draws "completely through the joint and also through the other sinuses a large seton of oakum, saturated with Peruvian balsam, letting the ends extend beyond the ulcers for some inches." The foot, being then placed in a suitable position, is fixed "by an anterior splint of plaster of Paris, from which arms extend around the foot and leg below and above the wound, so as to leave the latter entirely free for daily dressing." When the plaster has set, the joint is to be surrounded with a thick pad of oakum and firmly bandaged.

We can add our testimony to the efficacy of the oakum seton in cases of caries and of indolent sinuses from whatever cause. We have repeatedly used this mode of treatment during the last eight years, having learned it, we may add, from a former house surgeon of Bellevue Hospital (Dr. Lewis Fisher), who had, doubtless, seen the good results of the practice in Dr. Sayre's hands. Fifteen wood-cuts accompany this paper.

Art. V. *A Method of dressing Fractured Clavicle*, by LEWIS A. SAYRE, M. D., etc. etc.—"The dressing is prepared by cutting from strong adhesive plaster—that spread on Canton flannel or jeans, is the best—two strips four to six inches in width, and larger by half than the circumference of the chest. These are to be applied as follows: Begin by fixing the end of one strap upon the inside of the arm of the injured side, opposite the insertion of the deltoid. Carry the strap across the belly of the biceps and around the back of the arm, bringing the arm well back. Continue the strap horizontally across the back and around under the nipples. In fixing the end to the arm, care must be taken not to begin too far back, lest the arm be girdled and the circulation be arrested. This first bandage is the peculiar characteristic of the dressing, as it serves as a fulcrum by which the leverage of the other bandage is brought to bear. Into the axilla a pad of proper size should then be placed, and the

elbow pressed to the side, which carries the shoulder well *outward*. The hand should then be carried upon the sound shoulder . . . and the elbow supported at the desired point, while the second strap is applied as follows: Begin in front of the sound shoulder and carry the strap over the shoulder, diagonally down and across the back, so that its upper edge shall cross the injured arm about at the junction of the middle and lower thirds. The plaster is then moulded to the back of the arm and elbow, and dorsal and ulnar surfaces of the forearm, and finally drawn firmly over the back of the hand and overlaps the other end of the plaster on the top of the shoulder. It is well to fasten the ends together by a pin, which prevents the possibility of slipping. At the elbow the plaster should be made to fit accurately by cutting nicks in the edge and overlapping them. . . . If the fragments show a tendency to tip forward, I place over them a pad which is held in position by an adhesive strap passing from the back of the shoulder over the point of fracture and around the forearm, like a sling. The weight of the arm makes sufficient pressure upon the displaced fragments to keep them in position."

This mode of treatment, which Dr. Sayre considers superior to any other, was first suggested to him, he says, by a surgeon residing in Western New York, whose name he does not remember. Two wood-cuts accompany this paper.

Art. VIII. *Cases illustrating Strangulated Abdominal Hernia, with other Abdominal Hernia, not Strangulated, of Unusual Character, etc. etc., in all, seventy-three Examples; accompanied with Practical Remarks*, by FRANK HASTINGS HAMILTON, M.D., etc. etc.—This is a paper of 78 pages and is divided into chapters, sections, and subsections. It contains an account of seventy cases, derived principally from Dr. Hamilton's own practice, and from the records of the Bellevue and Charity Hospitals, though a few cases (of ovarian hernia) are taken from other writers. The nature of this paper is such as to preclude our giving an analysis of its contents, and we shall therefore merely refer to a few points of statistical interest with regard to the results of the cases. Thirty-one operations for strangulated inguinal and femoral hernia gave 15 deaths and 16 recoveries; the fatal cases being 12 out of 19 of non-congenital indirect inguinal hernia, and 3 out of 7 of femoral hernia; four cases of congenital and one of direct inguinal hernia all recovered. Three cases in which the omentum was cut away recovered, but a fourth in which it was first tied and then cut away, died. "Most or all of the cases, in which an enlarged omentum was returned, died also." Thirteen cases of strangulated hernia, reduced without operation, recovered; three cases died with the rupture unreduced; and one recovered with a temporary artificial anus. Prof. Hamilton calls especial attention to the value of posture as an aid to taxis, particularly in cases occurring among children. Two cases of incarcerated hernia were successfully reduced by operation, and one by prolonged rest, etc. This paper contains a large amount of useful material, and forms a valuable record of surgical experience.

Art. X. *Amputations performed at Bellevue Hospital*, compiled by F. J. METCALFE, Acting Junior Assistant.—This paper contains a table and summary of 55 cases of amputation and re-amputation performed at Bellevue Hospital between 1864 and 1869. Mr. Metcalfe classifies the cases which he records under four heads, viz., "immediate, or within twelve hours; primary, after twelve, and before the expiration of forty-eight hours; intermediate, after two days, and before the expiration of three weeks; secondary, after three weeks." No distinction is made between operations for traumatic causes and those for disease, the latter being included under the heading of secondary amputations. This circumstance, and the fact that the few cases recorded "represent but about one-sixth or one-eighth of the entire number" for the period named, diminish the value of Mr. Metcalfe's table for purposes of statistical reference.

Art. XI. *Report of Cases of Anæsthesia at the Bellevue Hospital, with the Use of a New Inhaling Apparatus*, by D. H. GOODWILLIE, M.D., D.D.S.—This paper gives a table of 50 cases, showing that with Dr. Goodwillie's apparatus, "as an average . . . it appears that two ounces and five drachms of ether would produce anæsthesia in five minutes and one second, and keep it up for twenty-seven minutes and four seconds, in a patient aged twenty-eight

years and six months." The apparatus, of which a wood-cut illustration is given, contains an arrangement of valves for inhalation and exhalation, with an index showing the relative quantities of air and vapour inhaled at any particular time. The advantages claimed for this mode of administering ether, are increased safety; lessened coughing, struggling and sickness; more rapid recovery from anæsthesia; and greater economy in the quantity of the agent employed.

Art. XIV. *The History of Eight Cases of Ovariectomy*, by T. GAILLARD THOMAS, M.D., etc. etc.—Prof. Thomas has no pity upon those persons who still look with doubt upon the operation in question, declaring that it "at the present time has reached a position so sure and unassailable in the esteem of the profession, that no one who desires to see his name stand in the list of those who favour advance in medical science ventures to depreciate it. It is true," he adds, "that here and there will be found those who even now declare that the procedure is one too hazardous in its steps and too fruitless in its results to warrant its adoption. But these will almost invariably be found to stand upon the same level with the men who systematically vilify the speculum and anæsthesia, and depreciate the value of the microscope and ophthalmoscope." Prof. Thomas looks upon ovariectomy, however, somewhat as the Father of Medicine did upon lithotomy, and suggests that the operation should not be "performed by men inexperienced in the diagnosis and treatment of ovarian tumours."

Prof. Thomas' own cases (a ninth having been added while the paper was being printed) give four deaths and five recoveries. "Out of the four unfavourable cases, two were instances of so-called alveolar cancer, one a solid tumour, and one a cyst, the whole of which could not be removed."

In dealing with the papers above-noticed, we have analyzed and quoted, rather than criticized, believing that by so doing we should best serve the interests of our readers, who can readily, from the abstracts furnished, form their own estimate of the comparative and intrinsic merits of the several articles contained in the "Reports." Should this volume be followed by others (as we sincerely hope it may), we trust that the list of contributors in succeeding years may embrace a larger number of the well-known names of the physicians and surgeons of Bellevue Hospital, so that the "Reports" hereafter may actually, as well as nominally, represent both the individual and the collective experience of the medical and surgical staff.

J. A., Jr.

ART. XXIII.—*Medico-Chirurgical Transactions*. Published by the Royal Medical and Chirurgical Society of London. Vol. LII. 8vo. pp. lxiv., 399. London: Longmans, Green, Reader and Dyer, 1869.

THE present volume of this most valuable series contains twenty-one papers, and is adorned with four plates and several wood-cuts. Eleven papers are of special interest to surgeons, and to these we shall first invite the attention of our readers, grouping together separately those papers which refer more particularly to the practice of medicine.

Art. I. is *On Excision of the Larger Joints; with a Table of Cases*, by HENRY LEE, F.R.C.S., etc.—This paper has already been brought before our readers in the Quarterly Summary of this Journal for April, 1869. Mr. Lee's remarks upon the operation of excision, as applied to the several joints, are judicious and interesting; we must protest, however, against his attempt to compare the operation statistically with amputation, upon the basis of the very few cases here presented. Surely the fact that twelve excisions of the knee gave only two deaths, while ten amputations of the thigh for chronic joint disease gave the same number, cannot be taken to prove anything with regard to the respective risks of the two operations. For statistics to be useful they must be not only accurate, but founded on a large number of cases.

Art. II. *The Results in thirty-nine Cases of Excision of the Knee*, by GEORGE MURRAY HUMPHREY, M.D., F.R.S., etc., is a paper of very great interest. It was,

like that of Mr. Lee, noticed in the Quarterly Summary of this Journal for April, 1869. Dr. Humphrey gives minute directions as to the steps of the operation, and especially as to the after-treatment, which he justly considers to be of the greatest importance. A foot-note mentions that, since writing this paper, the author has employed excision in six other cases, so that his entire number of operations is now forty-five, of which thirty-three have recovered, two have died, nine have subsequently submitted to amputation (four dying), while one remains under treatment. These results are certainly very favourable, and we cannot wonder that, judging from his own success, Dr. Humphrey should think that excision of the knee, though "requiring care in the execution, and care and patience in the subsequent management, . . . is not an operation of much danger." Unfortunately, however, whether from inferior skill, or from other causes, operators in general are less successful than the distinguished surgeon of Addenbrooke's Hospital; and hence, much as we admire the operation of knee-joint excision, and urgently as we would recommend its adoption in suitable cases, we cannot think that it is as yet proved to be in any individual case less dangerous than amputation.

Art. V. *On Fission and Extroversion of the Bladder with Epispadias; with the Results of eight Cases treated by Plastic Operations*, by JOHN WOOD, F.R.C.S., is perhaps, on the whole, the best surgical paper in the volume. As, however, a very full analysis of this important communication was published in the Quarterly Summary of the number of this Journal already referred to, we shall not dwell upon the subject here, further than to say that we believe the method of operation adopted by Mr. Wood in his later cases, to be altogether the best plan which has been yet suggested. This method (which is essentially that of Nélaton and Richard) has for its principal features the use of a reversed umbilical flap covered with sliding groin flaps, the urethra being covered at a second operation by a bridge of integument taken from the scrotum. Mr. Wood's valuable paper is illustrated with two lithographic plates, each containing four figures.

Art. VI. is a *Description of a Dislocation of the Head of the Femur, complicated with its Fracture; with Remarks*, by JOHN BIRKETT, F.R.C.S., etc.—The patient who was the subject of this remarkable form of injury was brought into Guy's Hospital on account of a fracture of the skull, and died soon after her admission. The lesion of the hip was not noticed until after death. It was then observed that the limb presented the characteristic deformity of a dorsal dislocation, while rotation of the leg elicited crepitus in the region of the hip-joint. Dissection showed the head of the bone lying on the posterior border of the acetabulum, between it and the great sacro-sciatic notch, and further examination showed that a portion of the head of the femur had been broken off, this fragment, with the greater part of the ligamentum teres still attached, remaining in the acetabulum.

"The fracture was remarkably even, and on a plane with the vertical axis of the shaft of the femur. The flat face of the greater segment lay upon the posterior surface of the os innominatum, just above the posterior edge of the acetabulum, being prevented from ascending higher by its attachment to the smaller segment, which was held in the cavity by the ligamentum teres. The cartilage forming a hinge between the segments, was in contact with the posterior rim of the acetabulum."

Mr. Birkett puts this case on record, chiefly on account of its rarity, and mentions that the complication of fracture of the head of the femur with dislocation, is not referred to by either Malgaigne or R. W. Smith. We may add that a reference to the learned work of our countryman, Prof. Hamilton, has likewise failed to find any description of this peculiar form of injury, so that it is probably, as Mr. Birkett says, "hitherto undescribed." With regard to the causation of the fracture, Mr. Birkett indicates two ways in which it might have happened. "Either the head of the bone was split by being driven against the strong edge of the acetabulum; or the strength of the ligamentum teres and its attachment was sufficient to overpower the cohesion of the bony tissue, whilst the femur was violently driven upwards and backwards. Perhaps both influences may have exerted combined action in the production of the injury."

In concluding this brief but interesting communication, Mr. Birkett alludes to the difficulty sometimes experienced in retaining the head of the femur in place after the reduction of a dislocation. The crepitus occasionally observed in these cases is usually attributed to the existence of a fracture of the acetabulum, but, as Mr. Birkett justly observes, may in some instances be due to a fracture of the head of the femur, as in the case which he has described. Two excellent wood-cuts illustrate this paper, the specimen which they represent being preserved in the museum of Guy's Hospital.

Art. X. *A third series of one hundred Cases of Ovariectomy, with Remarks on Tapping Ovarian Cysts*, by T. SPENCER WELLS, F.R.C.S., etc., may be looked upon as a sequel to the author's previous papers on Ovariectomy, in the 46th, 48th, and 50th volumes of the Transactions. An abstract of this interesting communication was published in the Quarterly Summary of this Journal for July, 1869, and we shall therefore refer at present merely to one point which was not then dwelt upon: this is the ground upon which ovariectomy and tapping respectively stand as operations admitting of comparison. In some rare cases, as of gangrene of an ovarian tumour, or of hemorrhage into an ovarian cyst, if ovariectomy be performed and death follow, "it is not the operation which is the cause of death, but the disease or accident from the effects of which the patient is not saved by the operation;" in such instances the operation may be fairly compared with tracheotomy, herniotomy, or primary amputation for injury. "But such cases as those just alluded to must be very rare exceptions to the large majority in which ovariectomy becomes the subject of consultation. There is generally as much time for discussion as in the parallel case of lithotomy in the male adult. And in both cases, the responsibility of operating with the full knowledge that if the patient be not saved by the operation, he or she is killed by it, must be fairly faced. . . . Tapping stands on a totally different ground. As a rule, when a patient dies after tapping, it is not because tapping has hastened her death, but simply has not succeeded in saving her life." By this course of reasoning, which strikes us as eminently sound and judicious, as well as by carefully compiled statistics, Mr. Wells has proved, we think, incontrovertibly, that the common prejudice against tapping in ovarian disease is unwarranted.

Art. XI. *Nephrotomy as a Means of treating Renal Calculus*, by THOMAS SMITH, F.R.C.S., etc., has also been noticed in the quarterly summary of this Journal for July, 1869. The method of reaching the kidneys, proposed by Mr. Smith, is as follows: "The patient being in the prone position, a longitudinal incision should be made along the outer border of the erector spinæ muscle, beginning at the lower margin of the last rib, and extending downwards for four inches towards the ilium. The skin and fascia, the latissimus dorsi, the serratus posticus inferior, and a layer of the fascia transversalis, being divided, the quadratus lumborum muscle is exposed; this with the erector spinæ should be drawn towards the middle line with a retractor, and the body of the kidney will come fully into view; the fascia surrounding it being laid open, the finger can be passed inwards, so as to touch the hilus of the kidney and feel the commencement of the ureter and pelvis." By this operation, which Mr. Smith thinks would not put the patient's life in any serious danger, it would be possible to ascertain by direct tactile examination whether the size and shape of the stone were such as to admit of its removal before going so far as to open the kidney itself. As, however, the possibility of thus extracting a stone from the kidney is still doubtful, the author wisely recommends that nephrotomy should not be attempted on the living subject until the feasibility of the operation has been tested upon the body of some patient who may have died with renal calculus.

Art. XIII. *Cases of Iritis occurring in Syphilis treated without Mercury; with Remarks on this Form of Iritis*, by GEORGE G. GASCOYEN, F.R.C.S., etc. —This paper is of considerable interest. Mr. Gascoyen's plan is to apply a neutral four grain solution of atropia to the eye three or four times a day until dilatation begins, and subsequently once or twice a day, continuing the application for some days after the disappearance of lymph from the iris, and after the pupil has become regular or so long as forced dilatation seems to produce

a good effect upon the adhesions. The eye is at the same time frequently bathed with warm water and shaded from the light, a weak alum and opium wash being employed in case of severe conjunctivitis. Leeches or blisters to the temple, opium internally, or tonics, wine or saline diaphoretics, may each be used in suitable cases; to these various remedies, iodide of potassium may be added in cases of old-standing syphilis. In all the recent cases in which Mr. Gascoven has employed this method, complete recovery followed; while in cases of longer duration, and in which adhesions had already formed, "useful vision was regained in all, and perfect vision in most." The use of atropia was continued for from fourteen to forty-nine days, the average period being twenty-six days. Mr. Gascoven has never observed any injurious effect, either local or constitutional from the use of atropia, nor has he found its efficiency diminished by prolonged use.

There are, according to our author, two distinct forms of iritis met with in syphilis, only one of which (*iritis parenchymatosa*) is really the result of syphilitic contamination; the other variety (*iritis serosa* or *peri-iritis*) attacks the surface of the iris and membrane of the aqueous humour, and accompanies the earlier or secondary manifestations of syphilis; the constitutional condition in these cases acts merely as a predisposing cause, any external irritation being capable of exciting this which is the most frequent form of iritis. "In these cases . . . the iris is not primarily attacked, but the eye affection commences with congestion or subacute inflammation of the conjunctiva, more especially in that portion of it which covers the sclerotic and receives its supply of blood from the anterior ciliary vessels."

These cases are very amenable to treatment, and a favourable termination may be expected when the disease is recent, even although the inflammation be severe.

"In the other variety of iritis . . . the disease commences in the iris itself, and this membrane becomes the seat of an indolent, almost painless, inflammatory action, accompanied by deposit of large yellow tubercles into its substance. The aqueous humour and cornea are but slightly implicated, and if the conjunctiva be affected it is secondarily to the iris. The deep-seated structures of the globe will also sometimes take on a chronic low form of inflammation, and then disorganization of the eye is not an uncommon result, or at least some grave permanent lesion.

This form of iritis is very insidious in its progress, and is met with, though fortunately not very often, in persons who are suffering from tertiary syphilitic manifestations. With regard to the nature of the deposits found in syphilitic iritis, Mr. Gascoven says that "the investigations of the best modern observers go to show that these tumours bear a very close resemblance to those met with in other parts of the body in advanced constitutional syphilis, and that they are developed about the same time that deposits begin to take place in the internal viscera. The microscope further proves that these iritic tubercles consist of elements identical in all respects with those composing a gummatous tumour, a product unanimously assigned to that period of syphilitic disease where nodes, tubercles, ulcerations, etc. are present."

While our author has tried, and we think successfully, to show that mercury is not necessary in the treatment of syphilitic iritis, he of course does not deny the value of this remedy in various conditions of syphilitic disease. An elaborate table gives the details of Mr. Gascoven's cases, eighteen in number.

Art. XIV. *On a Case of Fusiform and Tubular Aneurism of the Subclavian Artery, and its successful treatment by indirect Digital Compression*, by ALFRED POLAND, F. R. C. S., etc., to which is appended a case of *Subclavian Aneurism successfully treated by direct Compression*, by F. M. CORNER, Esq., of Poplar, and followed by the notes of a successful case of *Amputation at the Shoulder-joint for Subclavian Aneurism*, by PROFESSOR SPENCE, of Edinburgh, has already been noticed in the quarterly summary in the number of this Journal for January, 1870.

Mr. Poland invites attention to two anatomical peculiarities which greatly facilitated the cure by compression in the case of his patient; one of these was the abnormal course of the right subclavian artery which "emerged from be-

tween the scaleni muscles fully two inches above the clavicle, or rather more," then taking "an almost vertical yet oblique course to gain the axilla," and passing "behind the clavicle, a little to the inner side of the junction of the external third with the internal two-thirds of that bone." The other anatomical peculiarity referred to was "the probable existence of a cervical rib which gave support to the artery from behind." It can readily be seen that the coincidence of these two peculiarities would greatly tend to adapt the case for the successful application of pressure. A number of similar cases are quoted from various writers, among whom we observe the late Dr. J. Mason Warren, of Boston, here referred to as Dr. J. W. Warren, of Philadelphia.

A point of considerable clinical and pathological interest in Mr. Poland's case was the absence of pulsation in the arteries below the tumour, although the latter was itself quite pervious to blood, a circumstance which the author is disposed to attribute to obstruction of the vessels from chronic arteritis. There is one point in connection with the diminished or absent pulsation in arteries below aneurismal tumours which we think has not received as much attention as it deserves, and this is the fact that an aneurismal sac or dilatation, by the elasticity and resiliency of its walls, acts upon the blood current just as an air chamber or stand-pipe does upon a stream of water, equalizing and regulating the force of the current and thus measurably annulling its pulsatile character; this property of an elastic medium is familiar to all students of hydraulics in the case of the ordinary *hydraulic ram*, and precisely the same law of physics is in operation in every case of aneurism, and, as we have said, is, we think, more influential than is usually supposed.

Mr. Corner's and Prof. Spence's cases, which are given as appendixes, are now published for the first time, and are both of much interest.

Art. XV. *A Case of Double Aneurism affecting the Right External Iliac and Femoral, and the Right Popliteal Arteries, cured by Pressure upon the Common Iliac and the Femoral Arteries*, by JOHN HILTON, F.R.S., etc.—The patient was a healthy man of 45; the iliac aneurism having existed for two years, and that in the popliteal space for about nine months. The first attempt at compression proved a failure, although a tourniquet pad was kept upon the common iliac artery for over six hours, while the patient was under the influence of chloroform. Twelve days afterwards pressure was again applied, two tourniquets being used on this occasion, one to the common iliac and one to the femoral artery, and this time the treatment was successful, pressure having been maintained (the patient being under the effect of chloroform) for nearly ten hours. From the subsequent history of the case we learn that it was eleven weeks before the patient was able, with help, to walk down stairs, having suffered during most of this time from intense pain and hyperæsthesia in the affected limb, and requiring in consequence large doses of opium. When last heard from, after he had left the hospital, the patient was well, but still had painful sensations occasionally in his leg and foot.

Art. XVI. *A Case of Aneurism of the Femoral Artery treated by long continued Compression of the Common Iliac; with Remarks*, by JOHN BIRKETT, F.R.C.S., etc.—In this case the patient was 41 years old, and somewhat enfeebled by irregular habits of life. Compression, as in Mr. Hilton's case, with chloroform, was employed on three occasions for eight and a half hours, nine hours and ten minutes, and ten hours and twenty minutes respectively; periods of eight or nine days intervening between the trials. The patient died nine days subsequently to the last attempt, apparently from a low suppurative form of pneumonia; the aneurism after death was found to contain a good deal of laminated fibrinous deposit, with a large quantity of clotted blood, the coagula being evidently of post-mortem formation. We cannot agree with Mr. Birkett in thinking that the untoward results in this case do not impugn the advantages of the treatment employed, for though doubtless any other plan might have proved equally unsuccessful, the fatal issue of the case must certainly tend to shake any one's confidence in the alleged harmlessness of prolonged compression with anæsthesia, as a remedy in the treatment of aneurism.

Art. XVII. *On Transverse Fractures of the Patella*, by JONATHAN HUTCHINSON, F.R.C.S., etc.—This is a paper of very great interest. Mr. Hutchinson

places his views as to fractures of the patella in the form of propositions, some of which accord with, while others are in direct opposition to, the ordinarily received doctrines of surgical writers. Thus, in Prop. X., Mr. Hutchinson declares that "There is no persistent contraction of the quadriceps extensor or of any part of it, after transverse fracture with separation. When the spasmodic effort which attended the fracture ceases, the muscle usually remains completely and permanently at rest." The usual plan of elevating the limb, our author considers useless, preferring to treat all fractures of the patella in what he calls the longitudinal, by which we suppose he means the horizontal, position. The most important points of the paper are finally recapitulated in the following sentences: "I have tried," says Mr. Hutchinson, "to show—

"1. That a very remarkable state of physiological inactivity in the damaged muscle results from fracture of the patella.

"2. That the fact of this inactivity destroys the common explanation of the displacement of the upper fragment.

"3. That this displacement is usually due not to muscular traction from without, but to fluid pressure from within.

"4. That the real cause of weak union is the bulging of fluid between the fragments.

"5. That atrophic shortening of the quadriceps often follows these injuries, and, whilst it greatly disqualifies the muscle for extension, renders flexion very dangerous to the uniting ligament.

"6. That an exceedingly interesting and curious occasional result is permanent and complete atrophy of the muscle concerned."

Mr. Hutchinson further adds that should these conclusions be confirmed by further experience, they may also be found applicable to other forms of fracture and of injury to tendons. "Indeed," he adds, "it is in the possibility that they may illustrate a physiological law of wide bearing, that their chief interest consists."

Of all the good surgical volumes of the *Medico-Chirurgical Transactions*, we know of none which is more uniformly excellent than that which we now lay down.

J. A., Jr.

We shall next call attention to the medical papers in the volume.

Art. III. *On Certain Points in the Physiology and Pathology of the Fifth Pair of Cerebral Nerves*, by JULIUS ALTHAUS, M.D., M.R.C.P., etc.—The only two cerebral nerves, the physiology of which, Dr. Althaus thinks, remains in an unsettled condition, are the pneumogastric and the fifth; this he attributes to the fact that these nerves are endowed with far more complex functions than their fellows. The case which he reports in this paper is of unusual interest, and is well worthy of an attentive perusal, especially by those interested in diseases of the nerves; but in consequence of its extreme length, we are unable to transcribe it in full to our pages. There was complete loss of function of the whole fifth pair of cerebral nerves, unaccompanied by any other affection of the cerebral and nervous systems.

The patient was a man aged 27 years, a sheep farmer living in Australia, who, in consequence of exposure to a keen wind, was suddenly seized with pain in the left side of the head and face. Some time afterwards, as the result of a similar exposure, the right side of the face became similarly affected, but the pain was not so severe. In course of time the pain moderated, but coincidentally with its diminution, the corneæ became covered with dense opacities; that in the right eye being so complete as to destroy vision; that in the left was less thick, and permitted the patient to see faintly. The patient was at first treated at a hospital at Sydney, Australia, and some improvement in his condition appears to have been effected there. When Dr. Althaus first saw him, the muscles of the face contracted under the influence of Faradization, but there was entire absence of the sensation which always accompanies electro-muscular contractions in a healthy person. The sense of smell was preserved. Vision was of course obstructed by the thick leucoma of both corneæ and by photophobia. In the right eye there were delicate adhesions between the edge of the pupil and leucomatous portions of the cornea; and in the left, traces of the

preëxistence of iritis. Mr. Soelberg Wells made an ophthalmoscopic examination, and was unable to see the optic disk of the right eye, but found the lens and vitreous humours of the left eye clear and the background of the eye perfectly normal. There was no derangement of the motor nerves of the eye—there being neither ptosis, strabismus, nor double vision, while all the movements of the eye were easy of execution. The common sensation of the face and scalp was completely lost on both sides, except in the conchæ of the ears and the skin of the back part of the skull, and neither pricking, pinching, nor any other mechanical irritation was in the least perceived by the patient. Faradization with dry conductors did not produce any sensations, and a continuous current of great power, which in a healthy person could only be borne for a second, caused only a sensation of warmth, and pricking, a slight coppery taste, a slight phosphoric smell, and slight giddiness. The sense of temperature was completely gone and also that of touch, nor was the sense of locality preserved, for the patient could not tell the point where he was touched or pinched. There was also entire anæsthesia of the conjunctival mucous membrane; the secretion of the lachrymal gland appeared to have ceased, and could not be excited by mustard or ammonia; the eyeball, however, was kept moist by a hypersecretion of mucus. There was anæsthesia of the mucous membrane of the nose and mouth, and from both a very free secretion of mucus; that from the Schneiderian membrane having a very acid character. The tongue was lacerated, being constantly severely bitten whenever the patient took food, in consequence of its loss of common sensation. The secretion of the salivary glands appears also to have been arrested, and no irritant nor movement of mastication caused an increase in the moisture of the mouth. The insensibility of the gums was so complete that on one occasion, when the patient had a tooth drawn, he felt nothing whatever of the operation. The sense of taste was not lost, but in the anterior part of the tongue the perception of taste seemed to have lost its quickness, but no mistakes were ever made by the patient. The temporal, masseter, and pterygoid muscles were at one time completely paralyzed, so that the lower jaw hung down, but before the patient came under Dr. Althaus' observation the two former muscles had resumed their powers, but in consequence of the continued paralysis of the pterygoid, the lateral movements of the jaw were impossible. The patient heard distinctly, but was troubled by a continuous rushing noise in the head. The speech was only affected in consequence of the lacerated condition of the tongue. There was no history of syphilis nor of scrofula, and there was no evidence of disease of any of the remaining parts of the nervous system, nor of the chest, stomach, liver, bowels, skin, or genito-urinary organs.

The diagnosis made in the case was rheumatic inflammation of the neurilemma, first of the left and afterwards of the right trifacial nerve, where it emerges from between the transverse fibres of the pons Varolii at the base of the brain; the inflammation resulting in effusion and subsequent compression of the nervous tubules. This diagnosis was justified by the fact that not a single fibre of the fifth nerve had escaped injury, while the pons itself was evidently not the seat of the lesion as there were no symptoms of disease of that part of the brain.

The treatment consisted in the systematic application of the continuous current to the several branches of the fifth nerve, the positive pole being fixed as centrally as possible, while the negative was gently passed along the peripheral ramifications of the nerve. No medicine was given. This treatment was continued for three months, and the following improvement was noted: Complete disappearance of the photophobia; diminution of the opacity on the corneæ; return of common sensation and the sense of touch in the left side of the forehead, the cheek, and the chin; re-establishment of the sense of locality and to some extent the sense of temperature; reappearance of the secretion of the tears and saliva, and diminution of the excessive secretion of mucus and resumption of the power of contraction by the pterygoid muscle.

Dr. Althaus believes that very interesting questions are settled by the above case.

1. That the trifacial has nothing to do with the perception of smell, and that

the special nerve for that sense is the olfactory only, for in this case the special sense was never lost, while common sensibility was entirely absent.

2. That photophobia has little to do with the condition of the optic nerve or the retina. The corneæ receives nerves from the same source as the iris, that is, branches of the fifth, which have passed through the ophthalmic ganglion, and the iris possesses the faculty of contracting under the influence of light and dilating in the shade, from which we may infer that the iris has a sensibility to light peculiar to itself and independent of the retina. Photophobia may therefore be regarded, in certain cases, as a neurosis of the corneal branches of the trifacial nerve, and is, like many other neuroses, curable by galvanism.

3. The present case goes far to show that the branches of the fifth pair are the exciting, and the sympathetic fibres the inhibitory nerves of the secretion of the salivary and lachrymal glands, while the reverse seems to be true of the secretion of the conjunctival, nasal, and buccal mucus, and this is undoubtedly a bountiful provision of nature, for it thus appears that the important function of keeping the surfaces of the organs of special sense, and the commencement of the digestive and respiratory tract properly moistened, has been intrusted, not to one, but to two separate nerves, either of which will, to a certain extent, discharge the function of the other, if that other should be incapacitated by disease or accident.

4. That the sense of taste is dependent upon the glosso-pharyngeal nerve, and that the only part taken by the fibres of the fifth pair is in enhancing the quickness of the perception of taste.

5. That the effects produced by the application of the continuous current to the head and face, such as giddiness, sickness, dizziness, &c., are produced by reflex action from peripheral branches of the fifth pair to the base of the brain. for the present case shows that when the reflex functions of the fifth pair are in abeyance no cerebral symptoms can be produced.

Art. IV. *Remarks on the Natural History of Rheumatism*, by WILLIAM W. GULL, M.D., etc., and HENRY SUTTON, M.B.—This paper may be regarded as a supplement to the papers previously published by these gentlemen, the cases which are reported in it only serving to confirm the views previously held by them. They admit that the duration of rheumatic fever, when treated by alkalies, is shorter than when a purely expectant plan is pursued; for 13.5 days is the average duration of the cases by the former method, and nineteen days that by the latter, a difference which the authors seem to think of no importance, but which we are very sure will not be so regarded by the sufferers from the disease. They assert, moreover, that the alkalies have not the power to prevent cardiac complications, and attribute the immunity which is supposed to be due to their action to the fact that the greatest predisposition to heart trouble occurs in the early stages of the disease—before the patient is generally taken to a hospital.

Art. V. *On some new Double Salts of Carbolic Acid, particularly considered as Agents for the Treatment of Disease*, by ARTHUR ERNEST SANSOM, M.D., M.R.C.P.—It will generally be admitted that carbolic acid is a powerful agent for the destruction of organized germs, and is therefore indicated in the treatment of diseases which depend for their existence upon the presence of these germs. It is, however, an irritant and corrosive poison when given in large doses, and produces convulsions and other cerebral disorders when given in more moderate quantities, and is at all times a most nauseous remedy. Dr. Sansom tried some experiments to see if he could form soluble salts with the double acid which is formed by carbolic and sulphuric acid, and which resembles, in some of its properties, sulpho-vinic acid. With the aid of chemists he succeeded in forming the sulpho-carbolates of potassium, sodium, ammonium, magnesium, copper, and iron. Experiments were also performed to test the power which these salts possessed in arresting fermentation. The sulpho-carbolate of sodium was found to be the most efficacious in this respect, and as it has an agreeable taste, it was the salt selected for experiments upon animals and patients. 275 grains were given to two guinea pigs, without producing any other obvious effect than slight looseness of the bowels. The animals were afterwards killed, and their viscera subjected to a chemical analysis, but no carbolic acid could

be detected. The flesh of the animals was, however, observed to undergo putrefaction much less readily than other meat placed under precisely the same circumstances. Twenty grains three times a day were given to an adult, and with no apparent effect, so that the dose was subsequently increased to sixty grains, when a very slight tendency to vertigo and dizziness was produced, and the odour of carbolic acid could be readily perceived in the breath. Sulphate of soda could be readily detected in the urine of this patient, but no carbolic acid, and it is therefore probable that most of it was exhaled by the breath. With a view of testing some of its medicinal qualities, it was given to thirty-five patients affected with phthisis, in doses varying from 20 to 35 grains. In only four cases were disagreeable symptoms produced; in thirteen there was a decided improvement in the general health; in fifteen considerable improvement; and in only five was there no improvement. Dr. Sansom has, moreover, used this remedy in a large number of cases of zymotic disease (including diphtheria and very severe scarlet fever) during twelve months, and has had as yet no case which has terminated in death, or in any untoward complication, but his experience has been too slight to enable him to speak unhesitatingly of its value as a remedy in these diseases.

Art. VIII. *A Case Illustrating the Physiology and Pathology of the Cervical Portion of the Sympathetic Nerve*, by WILLIAM OGLE, M.D. Oxon., F.R.C.P., etc. —The case being one of unusual interest, we shall present a full abstract of it to our readers. The patient had served his full time as a soldier, and during that time drank freely and lived loosely, suffering repeatedly from delirium tremens and chancres. About three years before he came under Dr. Ogle's observation, a hard lump had formed on the right side of the neck, which, suppurating, left an abscess which was many months in healing. During this time his wife noticed that his right eye was smaller than its fellow, and the right ear redder than the left. A little later he suffered from a sensation of increased heat on the right side of the face.

Dr. Ogle noticed a large puckered scar on the right side of the neck, running in a transverse direction, and extending very nearly the whole way from the clavicle in front to the median line behind. In addition there were in the neighbourhood of the scar some indurated glands, and under the clavicle some dulness on percussion. The formation in the neck had evidently compressed the arteries in the arm, for no pulse could be felt either in the brachial or radial pulse. The palpebral fissure of the right eye was much narrower than that of the left; this was due partly to a lowering of the upper lid, partly to an elevation of the lower one, perhaps rather more to the latter than to the former cause. There was, however, complete control of the will over the upper eyelid, and both eyelids followed the motions of the eyeball. The right eyeball was somewhat retracted, but its muscular motions were perfect. The right pupil was much contracted, and the difference between the pupils was much increased when the eyes were shaded, but the difference disappeared under the influence of atropia when the irides were equally dilated. The right pupil reacted to light, but did so slowly, and within very narrow limits. The sight was unimpaired in either eye. The right ear was much redder than the left ear, and sensibly warmer to the hand. Gentle exercise had the effect of increasing the redness and warmth on the right side of the face; but whenever violent exercise was taken, it was found that the left side became warmer, not merely to the hand, but to the thermometer, and that the patient sweated exclusively on the left side. On the other hand, when ice was applied, the left ear became paler and colder than the other. The patient, moreover, asserted that whenever he walked in the wind, the left eye alone watered; that although there was an abundant discharge of mucus from the left nostril, none ever came from the right, and, lastly, that the right side of the mouth often felt drier to him than the other. On one occasion, when the patient was feverish, the thermometer indicated the same temperature in the two ears, and from this it was inferred that feverishness had the same tendency as violent exertion. The truth of the man's statements in regard to sweating exclusively upon the left side was satisfactorily proved to be correct by getting him to take violent exercise, and keeping him for an hour and a half in a Turkish bath. His other statements were not con-

firmed by experiments; but from his intelligence, and the straightforwardness he showed in all his answers, there was every reason to believe that they were accurate.

From the consideration of the various symptoms Dr. Ogle had no doubt that there was some lesion of the right cervical sympathetic, and in all probability a lesion which was equivalent to a division of the nerve. Dr. Ogle next proceeds to make a few remarks on the most notable of the symptoms. The retraction of the eye he believes to be due to the relaxation of a funnel-shaped muscle (*musculus orbitarius*), which although better developed in some of the lower animals still exists in man, and which is situated in the orbital cavity, and is always found to become relaxed when the sympathetic is divided and to contract when the sympathetic is galvanized; the diminution in the dimensions of the palpebral fissure is also a result of the section of the sympathetic in mammals, and widening of the fissure is as constantly produced by galvanization of the end of the nerve, which causes certain smooth fibres situated in the lids, and especially in the lower lid, to contract. The contraction of the pupils is, as is well known, a constant sequence of the division of the sympathetic in the neck; but, as in this case, both pupils dilated under the influence of atropia, Dr. Ogle is inclined to think that atropia acts not merely by paralyzing the circular fibres of the iris, but also by stimulating its radial fibres. Hyperæmia of the retina had probably existed at an earlier period, but had disappeared at the time an ophthalmoscopic examination was made.

The greater redness and heat of the right side of the face is of course accounted for by the palsy of the circular fibres of the bloodvessels and the consequent hyperæmia, and it was at first thought rather surprising that violent exercise should have inverted the relative condition of the two sides. Schiff, however, found that this was the case in a dog, after the healing of the wound made by section of the sympathetic whenever it was heated by running, and Dr. Ogle has obtained the same results by experimenting upon several rabbits. It would appear, therefore, that the vessels on the side of the section oscillate in size within very narrow limits, their minimum width being greater and their maximum less than that of the vessels on the sound side. To explain this phenomenon in an entirely satisfactory manner is not possible, but Dr. Ogle is inclined to admit with Schiff that the cervical sympathetic contains not only nerve fibres, whose office it is to cause arterial contractions, but others also, in smaller numbers, which when stimulated produce dilatation. It is to the section of the former more abundant ones that the ordinary result of hyperæmia is due, and it is to the section of the latter that the inability of the arteries to dilate fully is ascribed. This explanation, Dr. Ogle does not pretend, will cover all the cases, and to explain some outlying facts he refers to some observations of Drs. Mitchell, Morehouse, and Keen, who found that the first effect of a nerve lesion is to relax the muscles supplied by the nerve, but in many instances this relaxation subsequently gives place to a contraction which may or may not be associated with a corresponding degree of atrophy, and this result, it will be remembered, is not infrequent after injury of the fifth nerve. Similar physical changes are believed to be produced in the muscular coat of the arteries when its motor nerves are divided, giving rise in the first instance to excessive hyperæmia and copious sweating, and later to a gradual diminution of the hyperæmia and suppression of sweat, and it can readily be understood, in consequence of the unyielding character of the arterial walls how heat, exercise, or febrile excitement would be able to produce very little effect upon them. A case is reported by the American physicians above referred to in their book on gunshot wounds, which presents many points of similarity to that reported by Dr. Ogle. An officer was wounded on the right side of the neck and afterwards suffered with slight ptosis of the right eye, with contraction of the pupil and imperfect vision. Whether there was hyperæmia in the early stages is not known, but two years after the reception of the wound there was no unilateral flush; there was, however, a marked defect in the secretion of sweat on the side of the lesion extending to the neck, arm, and chest, while on the left side, which was not wounded, the secretion was perhaps excessive in amount.

This case possesses considerable interest, and the record of the symptoms should be compared with those presented by the case reported by Dr. Althaus.

Art. IX. *On the Operation for the Relief of Chronic Inversion of the Uterus, with the History of a Case successfully treated by a New Method*, by ROBERT BARNES, M.D., F.R.C.P., etc.—Dr. Barnes is inclined to think that of all the methods for reducing chronic inversion of the uterus, that which promises most hope of success is that by sustained elastic pressure; it has undoubtedly this great advantage over ligature or excision of the inverted portion of the uterus, that it does not unsex the woman. The danger to life is of course much less than by either of the other operations. Mr. Hake has reported a case of nine years' standing in which reduction was effected by keeping up pressure for fourteen days. To hasten the cure, Dr. Barnes recommends that the neck of the uterus should be incised in two or three places.

Art. XII. *On the Treatment of Phthisis by Prolonged Residence in Elevated Regions*, by HERMANN WEBER, M.D., F.R.C.P.—The term "elevated regions" is intended to comprise those localities in which, owing principally to their elevation, phthisis is either absent, or of rare occurrence amongst the inhabitants. The elevation necessary to secure this immunity from phthisis varies considerably in different latitudes; thus in the tropical zone, it may be regarded as about 8500 to 9500 feet, while in the temperate zone it is considerably lower, and at Kiachta, in Siberia, on the Chinese frontier, 2200 feet above the sea level is sufficient. It is of course probable that there are other influences besides mere elevation, which concur to render one place a better resort than another, among which may be mentioned the exposure, the prevailing winds, the situation of the place, whether on table land, or the top of a hill, on the slope, or in the valley.

The principal objections which are made against sending patients to elevated regions are: 1. That cold is injurious to those predisposed to consumption, or to those already exhibiting the signs of an early stage of the disease. 2. That the moderately rarefied air of a mountain health resort predisposes to pulmonary hemorrhage; and 3. The popular idea that climates with a uniformly warm temperature are the best for consumptive people. The first of these objections Dr. Weber meets by saying there is nothing to show that cold is in itself a predisposing cause of phthisis, although the disease, in the poorer classes, may sometimes indirectly arise from it in consequence of insufficient clothing, or the overcrowding which it causes. On the other hand, it is a matter of experience that patients are very apt to be benefited by clear, cold, dry weather; and there is no part of the world where phthisis assumes so acute a character as in the low, hot, and moist regions of Mexico. The fear of hemorrhage in elevated regions seems to be derived from the reports of those who have ascended high mountains, and is not borne out by the experience of patients who have been sent to elevated regions, for of the thirty-one patients whose histories are either given or referred to in the paper, only one had slight hemoptysis while residing on a high level; while as many as twelve had from one to four attacks while residing in low elevations. Dr. Weber's experience and those of his patients favours the presumption that there is also less tendency to bronchial catarrhal affections, and a greater probability of absorption and cicatrization of the products of chronic pneumonia. The histories of seventeen cases are given, many of them far advanced; in four death took place; but even in these a temporary improvement had occurred, and in two of them, the disease, after apparent cure, returned in consequence of the return of the patients to the crowded courts of London.

In regard to the *modus operandi* of elevated places, Dr. W. is not prepared to venture an explanation. The air of elevated regions is lighter, more rarefied, and cooler, and it is usually free from the foreign admixtures found in towns, and also from the various kinds of malaria. He asks the questions: "Is less oxygen inhaled, and the combustion retarded? or does the diminished quantity of oxygen lead to increased respiratory movements? or is there a greater mobility of atoms in high elevations, making atonement for the smallness of their number by the promptness of their action? or does the large amount of ozone increase the oxidizing power?"

Art. XVIII.—*A Case of Dissecting Aneurism of the Aorta*, by C. HILTON FAGGE, M.D., M.R.C.P.—This paper contains the account of the autopsy in a case of this disease, Dr. Fagge not having seen the case during the lifetime of the patient, who died at the age of 71.

"On opening the thorax, it was at once seen that the anterior part of the arch of the aorta was much larger than natural. When the canal of the aorta was laid open, a most remarkable condition was observed. At a distance of less than an inch above the aortic valves, the inner and middle coats were divided in the whole circumference of the tube, so as to form an oval aperture with a smooth, slightly-everted margin projecting into the cavity of what had been supposed to be the arch, but was now seen to be a large aneurismal sac, formed (mainly, at any rate) from the external coat of the aorta. The separation of the aortic coats extended, on one side (in front and towards the right), down to the base of the heart, thus coming into close proximity to the base of the right ventricle. On the left side, and behind, no such separation existed; and here only the edge of the divided coats and the different appearance of the lining membrane served to mark off the inner surface of the aorta from that of the aneurism. About an inch and a half above the truncated extremity of the aorta, another large opening into the aneurism was seen, which led into the continuation of the arch. This aperture also was oval, and its slightly everted edge was perfectly smooth, except posteriorly, where a portion of it had been frayed off into an irregular tail or process of no great size. From this point two channels—the one aneurismal, the other the aortic arch—ran on for nearly three inches side by side; but the sac of the aneurism preponderated so greatly in size that the arch seemed, as it were, to be imbedded in its anterior wall. Of the three main branches of the aortic arch, the left carotid and the left subclavian came off normally; the blood had not, to any extent, forced a passage between the coats of these arteries, only there were slight indentations in the wall of the aneurism, which marked the origins of the two branches, and indicated a slight tendency to the extension of the dissecting process along their tracks. The root of the innominate artery presented a different condition. Round the great part of its circumference the inner and middle coats of the aorta were completely torn away from it, so as to form an oval communication between the aneurismal sac and the interior of the arch. The innominate artery, in fact, appeared to arise more directly from the former than from the latter. The aperture of communication was like those above described, smooth, even, and with an edge slightly everted. A little below the left subclavian artery the outline of the aortic arch became more marked on the inner surface of the aneurism, and its canal almost immediately afterwards opened a second time into the sac. Here there was again a sharply-defined edge, indicating that the inner layers of the aortic coats had been torn through in their whole circumference; but the aperture was flattened and oblique, and was evidently smaller than that by which the blood entered the arch."

"Beyond this the blood was, for a space, confined only by the aneurismal coats, but about an inch lower, the tube of the aorta recommenced by an oval smooth opening, just like those described."

"There was, thus, again a double channel, a sort of double aorta, and throughout the whole length of the main arterial canal this disposition was preserved. The anterior of the two channels was that of the original aorta; the posterior was that of the dissecting aneurism. This last quickly diminished in size below the aortic arch, and throughout the mediastinum and along the lumbar vertebræ, its calibre was probably about equal to that of the aorta in front of it. On transverse section the form of the two channels was very different; that of the aorta was circular or oval, that of the aneurism semilunar. Below the bifurcation of the aorta, the disposition differed somewhat on the two sides of the body. The left common iliac was at first double, but the septum was maintained only for about a quarter of an inch, below which the aneurismal channel opened into the artery by a smooth aperture. In the right common iliac artery the channel was double throughout its whole length; but immediately below its division into the external and internal iliac arteries, an oval ring was seen in the external iliac artery, leading from the one tube into the other, and this

formed the termination of the aneurism. The external iliac artery thus derived its blood partly from the aneurismal channel, partly from the common iliac trunk in front of it. The internal iliac was altogether single, and seemed to have received its blood entirely from the aneurismal channel."

"The state of the lining membrane and coats of the aorta varied greatly in different parts of their course. Commencing with the aortic valves, these were much diseased. Two of them were blended together, the line of union being marked on the upper aspect of the single valve which resulted by a thick mass containing much calcareous deposit. The interval between the valves was thus converted into a slightly sinuous transverse slit. The sinuses of Valsalva were much dilated, forming quasi-aneurismal pouches. The lining membrane of the aorta was smooth up to the point where it was first torn across, and the coats were almost free from atheromatous change. The lining membrane of the arch, again, was almost perfectly smooth; the surface of the aneurismal sac, on the other hand, was markedly uneven, and contained a good deal of atheroma. There was no coagulum in the interior of the sac, with the exception of a mass about two inches in diameter, and of no great thickness, which lay in the angle between the base of the aorta and the aneurismal wall, where it was, of course, out of the line of the blood stream."

"In the lower part of the chest and in the abdomen the appearances presented by the inner surfaces of the aorta and of the aneurism contrasted curiously with those observed above. Here the interior of the aorta itself was much roughened by plates of atheroma, and contained a good deal of coagulum adherent to its surface in patches. The aneurismal channel, on the other hand, had a remarkably smooth and polished lining—as smooth and polished as the lining of any healthy artery could be—except where there was an occasional patch of atheroma. Nor was it merely a lining membrane which had thus been developed in the new canal; the subjacent tissue, the fibres of which ran transversely like those of the middle coat of the aorta, was also to some extent a new formation. This was apparent from the fact that the fibres were easily traceable across the angles which marked the lateral limits of the separation of the aortic coats. In horizontal sections the channels of the aneurism was indeed seen to be surrounded by a ring of some considerable thickness, which passed all around it, and must therefore have been developed subsequently to the formation of the aneurism. Under the microscope this tissue was, seen to be made up of fibres identical in appearance with those of elastic tissue. It did not appear that any of the branches of the abdominal aorta had prolongations from the aneurism, so far as could be determined after the removal, when some of them were found to have been cut away. Nor did any of the arterial branches open into or communicate with the aneurism, with the exception of the small posterior branches, namely the intercostal and lumbar arteries. Some of these were found to have been cut completely across by the stream of blood. A probe introduced into the aortic orifice of one of these little branches passed directly into the aneurismal canal, and traversed this before entering the artery itself, which thus appeared to arise immediately from the aneurism."

The heart was much enlarged; the alterations in the other viscera unimportant.

The patient once had a sudden seizure—about six years before his death—when he suffered from intense pain about the head, which made him so faint, or, as expressed by a non-professional person who witnessed the seizure, so blue that she feared he would die; he recovered, however, after stimulus was given to him, and walked home, which was distant a mile and a half. After this a loud bruit was heard over the heart, and attributed to valvular disease. During the last year of his life he had occasional attacks of dyspnoea, and pain over the stomach and liver, but never over the heart. He continued to take horseback exercise, until within the last four or five months of his life, and about six months before his death he was thrown from his horse without apparently sustaining any ill effects. Dr. Fagge believes that there are only four, or at most five, recorded cases in which a dissecting aneurism is known to have extended along the greater part of the aorta, and in which life has nevertheless been maintained a sufficient length of time to enable the sac to become provided

with a distinct lining membrane. The great freedom of the patient from all severe symptoms is also commented upon, together with the slight duration of the only attack of faintness which he seems ever to have had, and the absence of these is attributed to the remarkably free and frequent communication between the aorta and the aneurismal sac. Dr. Fagge also calls attention to the lining membrane of the sac, and the presence in its walls of yellow elastic fibres. A plate representing the aneurism accompanies this paper.

Art. XIX. *On the Enlargement of the Viscera, which Occurs in Rickets*, by WILLIAM HOWSHIP DICKINSON, M.D., etc.—It is well known that in rickety children certain of the abdominal viscera are apt to increase in bulk; but the nature of this enlargement appears to be imperfectly understood, and is frequently supposed to be the same as the so-called albuminoid degeneration, to which it presents only a very superficial resemblance. Upon a careful examination of the liver and spleen in these cases, there is found to be a marked increase in their fibroid tissue, and this is found to be especially the case in the liver in the neighbourhood of the portal veins. In consequence of this alteration the organs become less friable than in health, hard, dense, and elastic. The kidneys are rarely affected, and albuminuria is very rare, as are also ascites and jaundice. An analysis of the organs shows a deficiency of the earthy salts, while the alkaline salts are present in normal amount; there is no reaction with iodine. Under favourable circumstances the affected organs have a strong tendency to recovery, and, even when swollen to the utmost, will occasionally return to their natural dimensions. A plate and several wood-cuts accompany this paper. J. H. H.

Art. XX. *A Second Communication on the Endemic Hematuria of the Cape of Good Hope and Natal*, by JOHN HARLEY, M.D., F.R.C.P., etc.—The first communication on this subject is contained in the 47th volume of these Transactions, and an abstract of it will be found in the number of this Journal for April, 1864. In this communication are to be found further proofs that the disease is due to a species of Bilharzia. The entozoa is supposed to enter the body of the individual, either through the skin or through the urethra while he is bathing, as those are most frequently affected who bathe most frequently in the rivers near the sea-coast. Some cases are, however, referred to, which tend to show that the ova of the parasite may occasionally be introduced into the stomach when salads and water cress are eaten. Dr. Harley thinks that hyoscyamus and belladonna, the active principles of which are wholly removed in an unchanged condition in the urine, when brought in contact with the parasite, will at least restrict its development, and, by constantly dwarfing its growth, ultimately destroy it.

Art. XXI. *Completion of the Case of Congenital Hydronephrosis*. Reported in the forty-eighth volume of the Transactions of the Society, by the late THOMAS HILLIER, M.D., F.R.C.P.—An abstract of this case, as reported in the 48th volume, appeared in the July number of this Journal for 1866. The present communication contains the further history of the case, together with an account of the autopsy. The boy died on the 5th of August, 1868. There was found in the abdomen a large cyst filling the greater part of its cavity, and measuring twenty-seven inches in circumference over the long diameter, and twenty-four inches over the short one. It was nine inches long, eight wide, and six and one-half deep. It contained 83 ounces of a clear fluid, having a pale lemon colour and urinous smell, and occupied the position of the right kidney. The right ureter was so much constricted that a small dressing-probe was with difficulty passed through it. The ureter and pelvis of the left kidney were much dilated.

ART. XXIV.—*Transactions of the Clinical Society of London*. Vol. II. 8vo. pp. xxviii. 228. London, 1869.

THE second annual volume of Transactions published by the young and vigorous Clinical Society of London, contains thirty-six distinct communications,

a short analysis of which we shall now proceed to lay before our readers. As usual, we shall consider separately the surgical papers, and those which are of special interest to practising physicians.

Art. I. is *A Case of Extreme Hypertrophy of the Epithelial and Papillary Elements of the Mucosa of the Tongue, Ichthyosis Glossæ, where after nearly twenty years, Epithelioma supervened*, by JOHN W. HULKE. This case, Mr. Hulke tells us, formed the subject of a communication to the Royal Medico-Chirurgical Society in 1864, but was refused publication by the council of that body, "although the disease is very uncommon, and as far as could be learned it had not been previously described." The disease is unquestionably rare, but it can scarcely be said to be undescribed, for Rayer mentions having "observed a morbid development of the papillæ of the tongue, in a man in all respects in very good health, which I regarded as precisely similar in its nature to local ichthyosis of the skin." Leaving this question, however, we will quote from Mr. Hulke's interesting paper the description of this curious affection, which he gives in the following words: "Ichthyosis is characterized by tough, white, raised patches on the surface of the tongue. Their colour is not unlike that of a thin film of boiled white of egg or wet kid leather. They are clinically distinguished from syphilitic condylomata by their thick epithelium and their wide superficial extent; and from syphilitic nodes and cancerous tumours by their restriction to the mucosa, by their exact circumscription, by the natural softness of the underlying muscular tissue (showing the absence of infiltration), and by the absence of ulceration and of infection of the lymphatics."

Mr. Hulke's patient was an athletic man, 43 years of age, who had suffered from the disease for twelve or fourteen years (this was in 1861), and had been himself in the habit of paring down the hypertrophied patches with a razor. Mr. Hulke cut off a small patch with a thin layer of the underlying muscle; the wound healed in about ten days. Three years later the man applied at the Middlesex Hospital, and upon this occasion, after fruitless efforts to destroy the hypertrophied surfaces by means of caustics, Mr. Hulke removed the larger one with the *écraseur*, and, a few weeks subsequently, the smaller patch with a knife, the patient this time fainting from loss of blood. The disease did not return, but in 1867 the tongue became the seat of epithelioma, and Mr. Hulke removed the anterior part of the organ with the *écraseur*. The disease returned, involving the neighbouring glands, and when the report closed the patient was gradually sinking. No direct connection appears to have been traced between the epithelioma which proved fatal, and the long continuing but eventually cured ichthyosis. The occurrence, however, of epithelioma in the site of warts and moles in the skin is so familiar, that it is not surprising that the same disease should be met with in connection with the somewhat similar affection of the tongue.

Art. II. *On Ligature of the Femoral Artery (under two conditions)*, by CHARLES F. MAUNDER. In this short paper is narrated a case of punctured wound of the femoral artery, cured by the use of ligatures above and below the bleeding orifice. During the operation, an opportunity was afforded for confirming Guthrie's observation, that after occlusion of the proximal end of a vessel, the hemorrhage from the distal end will be (for a time at least) of a venous hue. As Mr. Maunder justly observes, this fact might be of importance in determining the source of bleeding in some cases of secondary hemorrhage. From the successful issue of this case (which we hardly need say was treated in accordance with the ordinary rules of surgery), the author thinks it probable that ligature of the femoral artery is not so severe an operation as is usually supposed, and that therefore it might properly be resorted to in the treatment of traumatic inflammation of the knee-joint. As we have already in this Journal (No. for April, 1869, p. 472), expressed our views upon this subject, we shall merely add here that we consider the conclusion unwarranted by the premises.

Art. III. *Case of Subclavian Aneurism on the right side, in a patient who had a cured Subclavian Aneurism on the left side*, by CHRISTOPHER HEATH. The patient was a man aged 52, who four years previously had been under the care of Mr. Gamgee, of Birmingham, for aneurism of the left subclavian artery, the disease upon that occasion undergoing spontaneous cure without any mechanical treatment having been employed. When Mr. Heath saw the patient,

an aneurism involved the second and third portions of the right subclavian, the first part of the artery being at that time free. Treatment by rest, regulated diet, and the administration of iron and digitalis, failed to produce any benefit, but, on the contrary, the aneurism enlarged, involving after five weeks the first part of the subclavian artery, which had before been healthy. Digital pressure on the distal side of the tumour was subsequently tried, but without advantage; a postscript informs us that the patient died a few months later from hemorrhage into the air passages. In his remarks upon this case, Mr. Heath says that "no case of ligature of the first part of the subclavian or of the innominata has been successful," from which we infer that he is not acquainted with the remarkable case of Dr. A. W. Smyth, of New Orleans. (See No. of this Journal for July, 1866, p. 280.)

Art. V. *Wound of the Knee-Joint, followed by Acute Inflammation; subsidence of the Inflammation after Ligature of the Femoral Artery; recovery, under the care of Mr. LITTLE, communicated by CHARLES F. MAUNDER.* This case is referred to by Mr. Maunder in Art. II. of the present volume, and by reference to vol. iv. of the *London Hospital Reports*, we find it to be the same single case upon which the author based the paper there published upon "Ligature of Arteries to arrest Inflammation" (see notice in No. of this Journal for April, 1869, p. 472), so that by this time we may look upon the case as an old acquaintance. The patient was a healthy man, 33 years old, who received a lacerated wound of the knee-joint, which did perfectly well for a week, the wound being at that time healed. Traumatic inflammation then occurred, for which the femoral artery was ligatured, suppuration occurring notwithstanding, and the patient eventually recovering with partial ankylosis. We may perhaps be pardoned for saying that we think the patient got well rather in spite of than because of the ligature of the femoral artery, which seems to us to be no more entitled to the credit of the cure than a profuse epistaxis (which is incidentally mentioned as having occurred), and which would no doubt have been looked upon by our ancestors, as a happy effort of nature to amend the morbid condition.

Art. VI. *A Case of Acute Laryngitis with Spasm of the Glottis, treated by Tracheotomy, by ALEXANDER BRUCE.* This case, which was followed by recovery, is well told, but presents no features of special novelty. Mr. Bruce advises that in cases where laryngeal spasm rapidly supervenes upon symptoms of subacute laryngitis which have gradually become more intense, there should be no delay in resorting to operation; this seems to us to be going rather too far, for though we are convinced that the usual mistake is in putting off the operation too long, yet we think that in every case where the spasmodic element is prominent, at least a trial should be given to medicinal agents, especially opium, which under such circumstances will often be found to act very well. Mr. Bruce prefers *tracheotomy* to *laryngotomy*, and advises that the tube should not be allowed to remain longer than three or four days. Dilute carbolic acid vapour applied to the orifice of the tube, seemed in this case to diminish expectation and allay the tendency to cough.

Art. VII. *A Case of Gunshot Wound of the Leg; Amputation during Collapse, just below the Knee-joint: Traumatic Delirium; Fascial Abscesses of the Thigh; Recovery, by JOHN CROUCH. Communicated by MR. CALLENDER.* This case presents no features of special interest; the traumatic delirium was treated by the administration of large doses of laudanum, which were very well borne. The injury was received by the premature discharge of both barrels of a gun, there being two wounds of exit, but only one of entrance. The tibia was broken into ten pieces, and the fibula into three.

Art. X. *Acute Suppuration of the Hand and Forearm treated by Acupressure of the Brachial Artery, by CHARLES H. MOORE.* The patient was a woman in the last month of pregnancy, and the inflammation of the hand was caused by a needle entering the pulpy end of the right little finger. The acupressure pin was allowed to remain forty-eight hours, and during the next two months, numerous abscesses formed and were opened, the patient eventually recovering, though the state of her hand was, as Mr. Moore confesses, not satisfactory. "The fingers were bent, the wrist was distorted, and its movements were painful; the muscles of the forearm were much wasted, and the palmar

tendons, fasciæ, and thecæ were firmly bound together, contracted, and fixed." The author justly remarks that "these conditions did not appear to be in any way due to the acupressure;" to which we may add that neither does it appear that the condition of the hand would probably have been any worse, had acupressure been omitted.

Art. XI. *Case of Ruptured Intestine, in which the Bowel was punctured to relieve distension*, by THOMAS SMITH. This was a very interesting case; the patient, a boy of 13, was struck by a cricket ball in the right iliac fossa, in spite of which injury he remained upon the ground for an hour and a half, and then walked more than a mile to his home. The pain increased, and vomiting supervened, the ejected matter assuming a fecal character on the fourth day. Tympanitis increasing, Mr. Smith punctured the intestines with a fine trocar, through the linea alba, midway between the pubes and umbilicus, with instant relief to the boy's suffering. A large amount of gas escaped by the puncture, the vomiting diminished, the patient fell asleep, and three hours afterwards the bowels were freely moved, for the first time since the accident. The puncture in this case acted merely as an euthanasial measure, the patient dying quietly twenty-eight hours after the operation. An autopsy revealed general peritonitis, with rupture of the bowel and escape of its contents; "on examining the part where the puncture had been made by the trocar, a clean, round, and patent opening was found in the small intestine, while about ten minims of fluid intestinal contents had escaped, slightly staining the tissues. As, however, there appeared to be no special sign of inflammation, or any undue vascularity, in the neighbourhood of the puncture, it is probable that the fluid did not escape until after death."

Mr. Smith refers to seven other cases, in which the bowel has been punctured to relieve distension, benefit accruing in all, and in two instances the patients recovering, one after three, and one after no less than six punctures. Mr. Smith recommends the operation in cases of intussusception, stricture, etc., "in which tympanitis is often not only a source of severe suffering to the patient, but a cause of real danger to life, and in which O'Brien's [*sic*] tube is useless. In cases like these," he adds, "intestinal puncture affords a safe and efficient means of relieving suffering, of facilitating respiration, and, it may be, of saving the patient's life."

Art. XII. *A Case of Lithotomy, in which the Stone was not discovered, having probably fallen to the ground with the first gush of urine*, by T. HOLMES. Mr. Holmes begins by referring to the well-known fact, that the most skilful surgeons have occasionally cut for stone without finding any calculus. To the "three possible explanations" of such an occurrence given by the author, viz., that (1) there may have been no stone present, (2) the bladder may not have been opened, the surgeon working really into the recto-vesical space, and (3) the stone may have escaped with the first gush of urine, we would add a fourth, viz., that the stone if very small may lodge behind an enlarged prostate and thus escape detection—an accident which we have known to occur to a most distinguished operator. To guard against the exit of the stone with the gush of urine, we think it would be well if the rule were universally adopted to make a small prostatic incision, and effect dilatation with the finger *before* introducing the forceps; by this plan the gush of urine would almost invariably carry the stone (if small) directly upon the finger of the operator, and the possibility of the calculus escaping undetected would be prevented.

Art. XV. *Removal of a Solid Mass, probably a Growth, from the Tympanum, by Incision of the Membrana Tympani*, by JAMES HINTON. The tumour was a small, kidney-shaped mass of bright red colour, about three lines in length by two in breadth. It was of firm consistence, slipping away with a dense elastic feeling when seized by the forceps. Under the microscope it presented only a mass of small cells, with here and there an appearance of slight fibrillation." The removal of this growth (which Mr. Hinton considers analogous to the ordinary so-called polypus of the external ear) was attended with complete relief to the patient's symptoms (deafness and tinnitus), though a second incision, followed by the evacuation of mucus, became necessary three months later.

Art. XIX. *Large Lacerated Wound on the outer side of the Right Knee,*

laying open the Joint, and followed by Tetanus on the ninth day, by CARSTEN HOLTHOUSE. This was a case of acute tetanus, proving fatal on the third day of the disease, the twelfth since the injury. The wound was dressed with carbolic acid, "*à Lister*," in spite of which extensive sloughing occurred. Large doses of the extract of Calabar bean (one grain every hour) were given for the tetanic symptoms, and on the day preceding death, the wound was dressed with the watery extract of opium. "With our present knowledge of the pathology of tetanus," says Mr. Holthouse, "and of the morbid anatomy of the spinal cord, as revealed to us by the investigations of Dr. Lockhart Clark, and Dr. Dickinson, recovery would seem almost hopeless, unless we could attack simultaneously both the peripheral nerves and the cord. The Calabar bean, by diminishing the excitability of the latter, fulfils one important indication, that, namely, of procuring its physiological rest. We want a similar medicament for the afferent nerves; and it would be well worth trial whether opium (from its known paralyzing effects on the nerves) might not fulfil a similar office for the latter." An analysis of the urine, in this case, showed an increased excretion of urea, thus confirming Weiglin's statement, "that in tetanus and in all persistent muscular contraction, there is a larger production of urea than when the muscles alternately elongate and contract."

Art. XX. *Case of Subacute Traumatic Tetanus successfully treated by the Calabar Bean*, by C. HOLTHOUSE. This patient had for five years suffered from tapeworm, and had a month before being attacked with tetanus received a wound on the back of the hand, which was healed before he came under observation. The duration of the tetanus was about one month. Mr. Holthouse believes "that the exciting cause of the disease was the wound on the back of the hand," and that "there is no evidence to show that the existence of the tapeworm exercised any influence either in exciting or in keeping up the tetanic condition. As recoveries from subacute tetanus," he continues, "were not rare before the introduction of the Calabar bean, we cannot say absolutely that recovery in the present case was due to the action of that drug. It appeared, however, to prolong the intervals between the paroxysms, and to render them of shorter duration and less severe."

Very large quantities of the remedy were administered in this case, as much as $4\frac{1}{2}$ grains of the extract having been once given as a single dose.

Art. XXV. *On a Case of Sub-glossitis*, by CARSTEN HOLTHOUSE. The patient was a healthy man, aged 31, whose tongue became stiff and hard while he was eating his dinner, no apparent cause for the affection being discovered. When seen by Mr. Holthouse two days later, "saliva poured from the half-open mouth of the patient, as if he were salivated with mercury; but there was no fetor of the breath. The tongue formed a hard solid lump, filling up the posterior part of the mouth from floor to roof, and was perfectly immovable, . . . and the whole of the sub-glossic region was affected with a sort of solid cedema, which formed another tumour in front and below the tongue, and filled up the entire space of the floor of the mouth to a level with the free edge of the teeth of the lower jaw." Five incisions and the use of chlorate of potassa gargles produced no diminution of the swelling, but rapid improvement followed the substitution of borax gargles with the application of a flaxseed poultice to the neck, and the internal use of quinia. The whole duration of the disease was one week. The author points out the diagnostic marks between this affection (which he calls *sub-glossitis*) and ordinary glossitis, inflammation of the salivary glands, and common salivation. The disease might, he thinks, have originated in the introduction of septic material into a wound of the tongue which might have existed previously unperceived, or might have been produced while eating.

Art. XXVII. *Case of Syphilis*, by HOLMES COOTE. The patient was a medical man who became inoculated in the hand while attending a kept mistress in her confinement, and suffered from various secondary and tertiary syphilitic symptoms during the next twenty years. The primary affection in this case is said to have been "a simple abrasion," and with this and with "two other cases also having occurred in the persons of medical men, where the primary affection was a simple abrasion, and nothing more," Mr. Coote attempts to overthrow all that is known with regard to the natural history of venereal diseases (we use the

plural advisedly), and claims to have proved the so-called unity of syphilis. We have so lately expressed our convictions upon this question in reviewing Professor Bumstead's edition of M. Cullerier's splendid work [No. of this Journal for January, 1869, p. 115], that we shall not dwell upon the subject here, further than to say that we think Mr. Coote has, like many others, mistaken an error of diagnosis for an error of nature. As to the second point to which Mr. Coote refers, viz., the possibility of contagion from secondary lesions, the fact is now so well understood and so universally acknowledged by syphilographers, that we should scarcely have supposed it necessary to attempt its proof; more particularly since Mr. Coote's is not a case in point, it being distinctly averred that the woman who communicated the disease "probably, from the dissolute habits of her protector, might have had primary sores." One point of interest in this case was "that the ulcers seemed to follow the course of nerves," an occurrence which we ourselves have had occasion to observe.

Art. XXVIII. *A Case Illustrative of the Identity of the Syphilitic Virus in the Hard and Soft Chancre, with Remarks*, by A. MYERS. This case is quite inconclusive, the patient's mere assertion that he had never previously had syphilis being accepted as proving the fact, and his history while under observation being not much clearer than that of his previous life. Three days after exposure the patient "observed a scab on the penis which he picked off, and thus gave exit to some thick yellow matter." The sore extended, involving the reflection of the prepuce for an inch and a half, "the right groin being also a little swollen and painful." The sore was repeatedly cauterized with nitrate of silver; "the right groin glands rapidly suppurated, the abscess was lanced, and healed up in a fortnight again." A papular eruption afterwards appeared, and was only beginning to recede three or four months subsequently. Mr. Myers appears, like Mr. Coote, to think that dualists regard marked *induration* as a *sine quâ non* for constitutional infection: this we need scarcely say is not quite correct, and we may add that there is nothing in the history of Mr. Myers' case to show that the preputial sore was not what is known as a chancrous erosion, or (which is more probable) a secondary lesion originating in some antecedent contamination, and brought out by the irritation of the recent coitus; or it might have been a simple sore, the subsequent constitutional symptoms being due to a previous infection. As for the suppurating glands in this case, we scarcely need remind our readers that the *pleiade ganglionnaire* of true syphilis is bilateral and rarely suppurates, and that the chancroidal bubo affects only one gland at a time (Mr. Myers speaks of *glands*), forms an abscess containing inoculable pus, and does *not* heal up in a fortnight. The bubo in this case was doubtless purely inflammatory, suppuration being probably hastened by the repeated cauterizations of the prepuce. To illustrate how little reliance is to be placed upon the statements of venereal patients, we will mention that we have now under our care a man with unmistakable *pleiades ganglionnaires* of true syphilis in both groins, who attributes his affection to a blow from a box of sugar, and a woman with well marked chancroidal bubo, who professes herself totally unable to account for the origin of her disease.

Art. XXXI. *Case of Displacement of the Trachea from External Pressure*, by MORRELL MACKENZIE, M.D. This is an interesting case, and well described. Dr. Mackenzie believes that a tumour (non-malignant) existed in the anterior mediastinum of his patient, who was, however, in good health when the report closed, so that the diagnosis may, perhaps, never be verified by means of an autopsy.

Art. XXXII. *Case of Suppression of Urine very slowly Fatal*, by JAMES PAGET. This is a very interesting case; the patient was an old man of 74, and the suppression of urine lasted in all twenty-two days. During the first twelve days there were no constitutional symptoms whatever, but during the last ten, the ordinary signs of uræmic poisoning were gradually developed. During the whole twenty-two days, not more than a pint of urine was passed, and about half a pint more was found in the dilated right kidney at the time of the autopsy. A calculus had lodged in the right ureter, but not so tightly but that a probe could be passed upwards by its side. "The interest and rarity of the case," says Mr. Paget, "are in the long continuance of the suppression of urine, and

in the almost complete absence of any consequent disturbance of the health during a great part of the time. . . . He was rather more sleepy than usual, and lost some of his muscular power, but he felt no discomfort, and lived nearly as he did in health." Mr. Paget thinks this tolerance to have been due to the slowness of the changes of nutrition accompanying old age, rather than to any want of sensitiveness due to idiosyncrasy on the part of the patient.

In concluding our examination of the surgical work done by the Clinical Society during the session of 1868-9, we would express our high appreciation of the practical utility of its labours; we know of no similar volume, of its size, which contains more really valuable material than that which we have been considering.

J. A., JR.

We now proceed to notice the strictly medical papers, the first of which is

Art. IV. *Cases of Ascites successfully treated with Tonics*, by J. S. BRISTOWE. The object of this paper is to advocate in the treatment of ascites the employment of tonics, which, the author thinks, will more frequently cause a disappearance of the effusion than the remedies usually employed. Ten cases of abdominal dropsy are reported; in nine of these a complete cure is said to have been effected, and in the tenth great improvement. In all but one tapping had been resorted to once or twice before the patients were either placed on the tonic treatment or could be said to be under its influence. It is scarcely necessary to say that Dr. Bristowe does not consider all cases equally amenable to this treatment, or that cures will be permanent when there is an irremovable lesion. In many cases, however, effusion into the peritoneal cavity is rather the result of the condition of the general health than of the disease of the liver or peritoneum. And in these cases treatment of a tonic character will generally prove more efficacious than diuretics or cathartics, just as a similar plan of treatment is frequently indicated in cardiac and renal disease, and causes the disappearance of anasarca by improving the tone of the general system, while the original disease upon which it was dependent, continues. The dropsy is not likely, therefore, to be removed in cases of malignant disease of the liver, of lardaceous disease of viscera, of obstruction of the portal circulation by a tumour, or in cases where it is directly or remotely due to disease of the heart, lungs, or kidneys, or of the pelvic organs in females. Benefit, however, has followed the employment of tonics in cases dependent upon tubercular peritonitis, cirrhosis of the liver, or on compression of that organ by contraction of its fibrinous investment. No one tonic has been used to the exclusion of others, this being manifestly impossible, as experience has abundantly shown that some tonics agree best with some patients, others with others.

Art. VIII. *Report of a Case of Diabetes Mellitus successfully treated by Opium without restriction of Diet*, by F. W. PAVY, M.D. The patient in this case was a woman aged 68 years, who, previously to the attack of diabetes, enjoyed good health, and whose occupation was that of a nurse in private families. Four years before coming under Dr. Pavy's observation she began to suffer from inordinate thirst, and two years later it was definitely ascertained that there was sugar in her urine. When Dr. Pavy first saw her she was passing five pints of urine in twenty-four hours. Upon her admission into Guy's Hospital, an alkaline draught was ordered for her, and through a mistake she continued to take this as long as she remained in the hospital, but it was thought to have had little or no influence upon the result. Her diet was unrestricted, and included meat, bread, potatoes, and beer, besides which she had four oz. of brandy and two bottles of soda-water daily. At first $1\frac{1}{2}$ grains of opium were administered daily for three days; then 3 grains for the same length of time; then $4\frac{1}{2}$ grains, then 6 grains, and so on until the daily dose reached $10\frac{1}{2}$ grains, which produced so great a degree of drowsiness as to induce a discontinuance of the treatment for five days, at the end of which time it was resumed, and 3 grains of opium given. As before, the dose was gradually increased until it amounted to 12 grains, and then, as no sugar had been detected in the urine for more than a month, the dose was gradually diminished. The first effect of the opium was to cause a diminution in the quantity of urine, while it temporarily increased the amount of sugar excreted. On the eighth

day a decided diminution in the quantity of sugar passed was noticed, and with the exception of occasional fluctuations this diminution was progressive up to the sixty-sixth day of the treatment, when only a trace could be found; the next day none could be detected, and after this there was only a trace until the eighty-eighth day, when it disappeared permanently. With the improvement in the state of urine there was a corresponding improvement in the general health of the patient. The patient appeared before the Society seven months after her discharge from the hospital, and seemed to be in perfect health. Her urine on being tested was found not to contain sugar.

Dr. Pavy also alludes to other cases which have been similarly treated also with success. In one case the patient, a man aged 50, after having had the amount of sugar in his urine reduced to 1000 grains by means of a restricted diet, took opium in doses which were gradually increased until $10\frac{1}{2}$ grains was the quantity taken daily, when the sugar disappeared from the urine, but in consequence of its reappearance the dose was gradually increased to 18 grains, when it again disappeared, and its subsequent reappearance was distinctly traceable to errors of diet. Another case is referred to in which morphia was substituted for opium, but unfortunately the patient left the hospital too soon for any decided effect to be produced, although the quantity of urine and its specific gravity had diminished. Still another case is reported, that of a man aged 29 years, in which the gradual increase of the dose of opium up to $13\frac{1}{2}$ grains caused the disappearance of the sugar from the urine on the thirty-ninth day. The dose of the drug was still further increased to $22\frac{1}{2}$ grains without the occurrence of disagreeable symptoms. On the contrary, the patient is said to have gained sixteen pounds. Dr. Pavy believes that the forms of the disease in which the opium treatment is most efficacious are those occurring in elderly people, in whom it has been observed to assume its mildest form. In the young and middle aged, on the other hand, the disease is generally of a more severe character, and the opium treatment will rarely alone suffice for its cure.

In this connection it will be well to notice Art. XXIX., *Case of Diabetes treated by large doses of Opium*, by J. BURDON SANDERSON, M. D. In this case the dose was gradually increased to 24 grains, in which quantity opium was given from May 20th until the beginning of August. This treatment together with a restricted diet brought about a reduction in the amount of sugar and of the urine, and a great improvement in the general health of the patient.

Dr. Pavy's paper is provided with a table showing the daily quantity of urine passed, its specific gravity, quantity of sugar per fluidounce of urine in grains, quantity of sugar per twenty-four hours in grains, and quantity of opium administered daily.

Art. IX. *Irritative Hypertrophy of the Heart*, by THOMAS HENRY GREEN, M. D. By the term irritative hypertrophy is meant increased development as the result of some abnormal irritation as distinguished from hypertrophy from excessive physiological stimulus.

Art. XIII. *Case of Chorea, in conjunction with Rheumatic Fever, treated with Bromide and Iodide of Potassium*, by EDWARD HEADLAM GREENHOW, M. D. In this case the choreic movements were so violent that the patient was in constant danger of falling out of bed, and the tongue was protruded and withdrawn so suddenly that it was difficult to ascertain its exact condition. There were in addition all the symptoms of acute rheumatism, and noisy delirium. Ten grains of the bromide and two of the iodide of potassium were prescribed—the ordinary alkaline treatment having failed to relieve the condition—and at the same time beef-tea and alcohol were administered. The patient began immediately to improve under this treatment, and four days later is reported to be almost free from chorea, free from rheumatism, and to have slept well.

Art. XIV. *Chorea complicating Pregnancy treated by Bromide of Ammonium and Arsenite of Potassa; later by the Bromide of Ammonium only*, by J. HILL DAVIS, M. D. The patient was 22 years of age, and three months advanced in pregnancy, and was said to be of an excitable, hysterical temperament. The choreic movements first affected the left arm, next the right arm, and then gradually spread over the rest of the body. There was a good deal of rolling

of the eyes and grinding of the teeth, together with protrusion and withdrawal of the tongue. She was very restless at times, throwing herself at full length upon the sofa. Valerianate of zinc, quinia, iron, henbane, camphor, and sponging the body with cold water, had all been tried, but had been productive of no benefit. Bromide of ammonium, gr. v, with 5 minims of arsenical solution was administered every four hours. At the end of the first week there was great improvement, and at the end of the first month the choreic movements had almost entirely ceased, and the arsenical solution was discontinued. A month later the patient miscarried in consequence, it was believed, of undue exertion. Although the arsenic was continued throughout the first month of the treatment, yet Dr. Davis is inclined to attribute the cure of the chorea entirely to the bromide.

Art. XVI. *A Case of Acute Rheumatism in an Epileptic with Obscuration of the First Sound of the Heart*, by THOMAS BUZZARD, M. D. The most marked features in this case were great frequency of the pulse—160 beats in the minute—and almost complete inaudibility of the first sound: observation, however, with the thermometer showed that the temperature of the body at no time exceeded 102° Fahr., and averaged only 100.9° Fahr., and this was regarded as proof that there was no serious inflammation of the heart or of its membranes. The patient ultimately recovered. There were no epileptic seizures during the acute attack.

Art. XVII. *Cases of Syphilitic Rheumatism*, by ALFRED B. DUFFIN. Two cases of this disease are reported, one of which occurred in the practice of Dr. Garrod. The most interesting point in connection with them is the fact that the temperature was liable to morning and evening oscillations extending over two, three, four, and even five degrees Fahr., the evening limit being always the highest and, on the whole, the most steady, and this was accompanied with a tendency to nocturnal sweating. In his case Dr. Garrod prescribed thirty grains of quinia daily without producing any modification in the result. Half drachm doses of sulphite of soda were then given, but although this checked the sweatings and diminished the pains, the oscillations in temperature still continued. Although there was no well-marked sign of phthisis, cod-liver oil in tablespoonful doses was given. It was not until fifty days after admission that sores of an unmistakably syphilitic nature appeared upon the surface of the body, when iodide of potassium, thirty grains daily, was prescribed. On the third day after the institution of this treatment the temperature fell to 98½°, and the nocturnal exacerbation ceased. After this the convalescence was steadily progressive towards health. In the second case, many of the same symptoms were presented, but having the light of the preceding case to guide him, Mr. Duffin resorted earlier to the use of the iodide and with the same good result.

Art. XVIII. *Cases of Hæmoptysis followed by Inflammatory Changes in the Lungs*, by CHRISTIAN BAUMLER, M. D.

Art. XXVI. *On Hæmoptysis as a Cause of Inflammatory Processes and Phthisis, with Remarks on Treatment*, by HERMAN WEBER, M. D.

We have placed these two papers together because they treat of the same subject, and the views expressed in them are essentially the same. Both Dr. Baumler and Dr. Weber are fully impressed with the truth of Niemeyer's theory that the occurrence of hæmoptysis by no means indicates the presence of any organic disease of the lungs, but that, on the contrary, it is the frequent cause of it. Any blood which is not expectorated, coagulating in the smaller bronchi and air vesicles and subsequently undergoing decomposition becomes an irritant which develops inflammation of the lungs. This, in its turn, may become the starting point of these chronic pneumonic changes, which constitute the chief part of the mischief in phthisical lungs. In the three cases reported by Dr. Baumler, there were no distinguishable signs of chest disease, either before or immediately after the occurrence of the hemorrhage, but in a few days catarrh of the smaller bronchi developed itself, and soon after the lung tissue became involved; in two of the cases, the inflammatory changes terminated in almost complete resolution, but in the third, the infiltration of the lungs was of a permanent character. The cases of Dr. Weber present a striking similarity to those just alluded to, for there was no organic disease of the lungs detected at

the first examination of the chest after the hæmoptysis, but in a few days the inflammatory changes manifested themselves, and in two of the three cases, underwent resolution, but in the third, led to caseous degeneration and death. Dr. Weber, however, differs from Niemeyer who thinks that hæmorrhage into the bronchial tubes does not necessarily lead to inflammation either of the lungs or pleuræ.

In the treatment of hæmorrhage Dr. Weber recommends entire rest until the thermometer shall have shown for at least five days, no abnormal temperature. In addition to the usual remedies, he is disposed to think well of an emetic of ipecac or antimony, which, of course, causes the employing of the bronchial tubes of the blood, and consequently prevents those inflammatory changes which would otherwise occur. It does not appear that the emetic has ever caused a recurrence of the bleeding.

Dr. Weber thinks that in cases where there is a tendency to hæmoptysis, climate is of great importance, and is in the habit of recommending prolonged residence in Alpine climates, and this he does also as a means to promote the cure of the effects of the inflammatory processes resulting from pulmonary hæmorrhage.

Art. XXI. *On a Form of Enlargement of the Right Leg and Thigh, with an Occasional Discharge of Chylous Fluid*, by W. H. DAY, M. D. The patient in this case was a boy aged 7 years. When $2\frac{1}{2}$ years old, his nurse noticed that the right leg was slightly larger than the left. This enlargement did not extend at first above the knee. When the child was 3 years old, the circumference of the calf of the right leg exceeded that of the left by two inches, and the right foot was noticed to become œdematous when he stood up for a long time or wore a low slipper, and when the shoes were removed at night, the right foot seemed to have been much more compressed than the other. The next year the enlargement was found to extend beyond the knee-joint, and the year after, a patch of small yellowish-white spots, ten or twelve in number, defined in outline, and distinct from each other, made their appearance on the part of the knee immediately above the head of the tibia, and seemed to contain a cheesy kind of matter, similar to what is often observed in small encysted tumours; these gradually dried up and disappeared. The leg became exceedingly hard after playing, so as to give the impression that the cellular tissue was the seat of the disease. When the system was out of order from any cause the limb always became larger, more heated, and covered here and there with irregular erythematous patches. In April, of 1866, Mr. Paget saw him, and said that he had never seen a similar case in any one under 20, and was inclined to think that there must be obstruction of nearly the whole length of the femoral vein. Towards the end of the year 1866, the prepuce became very heavy and pendulous, the hypertrophied part having the same indurated feel as the thigh. In July, 1867, the prepuce was removed by Mr. Paget. The sore left by the operation healed quickly. During the year 1868, a small white pearly-looking vesicle appeared in the upper part of the penis where the skin joins the mucous membrane. Similar vesicles made their appearance at various times on the leg, foot, and scrotum, and then gradually dried up and faded away. One night, after riding a short distance on a pony, the vesicle on the penis ruptured and a discharge, which saturated the mattress, issued from it, and was followed the next day by a similar discharge. The loss of so much liquid had the effect of reducing the stony hardness of the limb. The ruptured vesicle was supposed to be a varicose lymphatic, and the fluid flowing from it to be lymph. Mr. Paget was again consulted, and remarked, "I have not before seen such a case, but they are recorded and the issue of similar fluid is, I think, not rarely observed in the forms of elephantiasis which are connected with disease of the lymphatics." On January 12, 1869, after some emotional excitement, there was a recurrence of the discharge from the same vesicle. Some of the liquid was collected, and a portion allowed to remain in a wineglass for a few minutes coagulated so firmly as to have the appearance and consistence of blanc-manger. The following are the characters of the fluid and the results of a microscopic examination of it. "The chylous fluid had a faint, sickening odour, a salt-like taste, and was of alkaline reaction. There was no uniformity in the rapidity of

coagulation; one specimen being less milky and more serous than another. The clot bore the closest resemblance to that of blood, except being softer and destitute of red corpuscles. Dr. Beale, who kindly examined the fluid, found it to contain a large quantity of fatty matter and fibrine, a molecular base like chyle, and numerous pale cells resembling white blood corpuscles (chyle corpuscles)."

At about the time this second discharge took place febrile symptoms set in, accompanied by great heat and erythematous redness of the affected limb.

The following will enable the reader to compare the sizes of the two limbs:—

	Right or diseased limb.	Left limb.
Upper third of thigh	15 $\frac{1}{2}$ inches.	12 $\frac{1}{2}$ inches.
Lower third of thigh	12 "	9 $\frac{1}{2}$ "
Knee-joint	11 $\frac{1}{4}$ "	10 "
Calf of leg	11 $\frac{1}{4}$ "	8 $\frac{1}{2}$ "
Round ankle	10 $\frac{1}{2}$ "	9 $\frac{1}{2}$ "
Base of toes	7 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "

This is, as the reporter says, a case of extreme interest, and as the enlargement was discovered so early in life, there is every reason to believe that it was congenital, especially as no disease of infancy or accident had happened to account for it.

Dr. Day believes that the following conclusions are established in the case:—

"That it is a form of elephantiasis, connected with disease in the lymphatic system.

"That the enlargement in the leg, when first detected, was owing to some deep-seated obstruction to the circulation, and that the limitation of the swelling to the leg showed the impediment at this stage was slight, and promised to pass away.

"That the presence of chyle corpuscles satisfactorily settles the question as to the nature of the fluid, and proves it to be chyle. They were numerous, large, and perfectly developed. The coagulation was rapid and complete and the fibrine abundant. In one specimen there was unmistakable evidence of four red blood corpuscles. The physiological inference is, therefore, that the milky fluid passed directly from the thoracic duct into the neighbourhood of the dilated lymphatic vessels, and thus, by a retrograde movement, found its way out of the system. We are driven to this conclusion, because the composition of the chyle varies very much according as it is derived from the lacteal vessels, from the mesentery, or from the thoracic duct. The abundance of fibrine and chyle corpuscles, and the rapidity of coagulation, point to the latter spot as that of communication.

"That the great size the limb attained was owing to oedema and fibrinous infiltration into the subcutaneous tissues of the limb, as well as to growth, it may be, of the muscles; and that possibly there may exist in addition to these changes some fatty degeneration of their muscular structures."

Appended to this paper is the report of a committee appointed to examine the case, and also reports of similar cases by Mr. Berkeley Hill and Dr. Cholmeley.

Art. XXII. *Case of Fatty Diarrhœa, treated by Pancreatic Extract*, by Dr. LANGDON DOWN. This is the report of a man aged 52 years, who ascribed the illness for which he was admitted to the London Hospital, to a visit to the fever country, for shortly after going there, he suffered from pain in the epigastrium, passed more water than usual, and had evacuations containing fatty matter resembling beeswax. He said in reference to this discharge: "It runs from me like melted fat." There was yellowness of the face, a feeling of languor after the least exertion, and depression of spirits. The stools were semi-solid, with fat either at the top or in lump throughout the mass. No tenderness of the abdomen, nor any increase in size of the pancreas can be detected. The urine was increased in amount, contained a trace of sugar, and deposited crystals of oxalate of lime and uric acid. The fatty matter was found to be almost entirely soluble in ether; the slight residue consisting of a mixture of partially digested animal muscular fibre, vegetable fibre, and salts. It was soluble in alcohol, saponified with the caustic alkalies, and, when acids were added to it, nearly all of it proved to be stearine.

After the usual remedies had been employed and failed, pancreatic extract $7\frac{1}{2}$ grains in $7\frac{1}{2}$ grains of powdered malt were prescribed on October 1st, to be taken after each meal. The improvement under this treatment is said to have been rapid and marked; the stools decreased from seven to two a day, gradually gained consistence, and lost the appearance of fat. He was discharged cured two months after the beginning of this treatment, having gained twenty-two pounds in weight. No sugar could be detected in his urine at this time.

Art. XXIII. *Manganese, Nickel, and Zinc in Anæmia, Chlorosis, and associated Disorders*, by WILLIAM HENRY BROADBENT, M.D. No fact in therapeutics, the writer says, is more certain than that iron cures anæmia and chlorosis, and it is also well known that this metal stands in the centre of a group of metals closely allied to it in chemical properties, and which bear to it certain well-defined relations. The writer also holds "That substances closely allied chemically must have an analogous action in the system, or the diversity in their operation would be capable of explanation on chemical principles. In other words, chemical groups ought to form therapeutical groups." Manganese and nickel belong to the same chemical group as iron, and it is therefore not improbable that they have some of the same properties; and while it is hardly probable that either will ever replace iron as a therapeutic agent, it is quite possible that they may hereafter be employed as useful adjuvants. Manganese and nickel were given in several cases of anæmia and chlorosis either alone or in connection with iron, and in all cases, it was thought with a favourable result, and this in the case of dispensary patients who, of course, had not the advantages of warmth, rest, and good food generally secured to the in-patients of a hospital. In using these metals as accessories to iron, manganese seemed to have a special influence in promoting the return of the catamenia, and nickel a special property of checking leucorrhœa. The former may be given in doses of 7 or 8 grains without causing weakness of the stomach, but the latter generally causes vomiting in doses of $2\frac{1}{2}$ to 3 grains. Zinc was also tried under the impression that it belonged to the same group, but no good results followed its use, and it was then discovered to belong to another chemical group.

Art. XXIV. *Case of Motor Asynergy affecting chiefly the Upper Extremities*, by EDWARD HEADLAM GRENHOW, M.D. Motor Asynergy is the name that Dr. Greenhow prefers to give to the disease which is now usually called progressive locomotor ataxia. As this disease has been more than once spoken of lately in our pages, we shall merely indicate those points in which this case differs from the majority of reported cases. In the first place, the symptom which has given its name to the disease, was wanting, or, in other words, there was no loss of the faculty of muscular co-ordination, for the history tells us that the patient, although he complained of some feebleness in the limbs, was able to walk with his eyes shut, or to stand with his feet close together. Moreover, the committee to whom the case was referred, Drs. Buzzard and Moxon, found that the power of guidance of muscular action was very fair, "that, when blindfolded and required to point out with his finger spots where he is touched, he moves the finger pretty steadily to within a short distance of the spots," or when told to fold his arms when his eyes are shut, can generally cause his fingers to meet very nearly. There was anæsthesia in various parts of his body; the peculiar neuralgic pains, a sense of constriction around the trunk, diplopia, and a spasmodic affection of the fingers. The patient had perfect control over his sphincters. Notwithstanding that the faculty of co-ordination was not lost, the committee to whom the case was referred regarded it as one of locomotor ataxia, as most of the other symptoms which characterize that affection were present and they do not consider that the absence of a single important symptom necessarily withdraws this case from the group which has this name bestowed upon it, especially as this symptom cannot be proved to be essential to the existence of the disease, for it has been absent or little marked in other reported cases, while on the other hand it is an attendant upon other diseases, as for instance chorea. The committee think, moreover, in giving the name ataxia, to the disease that undue prominence is given to one symptom, and that it may become a source of error. They, therefore, prefer the old name, *tabes dorsalis*. If any symptom is to receive undue prominence in the name, it should be the pain, which is gene-

rally the first to appear, and if such a name were adopted, the disease would probably not so frequently be mistaken in its early stages for rheumatism.

Art. XXX. *On the Action of a new Organic Base, Apomorphia*, by SAMUEL GEE, M. D. A paper from the same writer, and bearing a very similar title, appeared in the last volume of the *St. Bartholomew's Hospital Reports*, and was noticed in the January number of this Journal for 1870. It is here only necessary to say that apomorphia is formed by the action of strong hydrochloric acid upon the chloride of morphia by which chloride of apomorphia is formed. The subsequent separation of the apomorphia from the chlorine is easily accomplished.

Art. XXXIII. *Case of Cholera treated with Saline Injections into the Veins of a Lower Temperature than that of the Blood*, by CHARLES MURCHISON, M. D. A woman in the collapse of cholera had injected into the right brachial vein 40 ounces of a saline solution, composed as follows: Chloride of sodium, 90 grains; chloride of potassium, 30 grains; phosphate of soda, 10 grains; carbonate of soda, 5 grains; distilled water, 40 fluidounces. The temperature of the solution when prepared was 100° F., but no measures being taken to keep up the temperature during the three-quarters of an hour the operation lasted, the temperature of even the fluid first injected was below that of the rectum, as ascertained by a thermometer placed in the anus. A temporary improvement followed even before 10 ounces had been injected, but it was unfortunately of short duration, as the vomiting and purging immediately afterwards returned, and the patient sank. Dr. Murchison says that the good effect of the injection into the veins is generally attributed to its warmth overcoming the arterial spasm and thus enabling the blood to circulate, but yet in this case the same happy result followed the injection of a liquid less warm than the blood.

In this connection it may be well to recall to our readers' recollection a paper of Dr. B. W. Richardson in the first volume of the *St. Andrew's Med. Grad. Assoc. Trans.*, in which a number of experiments were detailed, the result of which was to show that there was less difficulty in the passage of cold liquids through the capillaries of the dead body than of warm. A brief notice of this paper will be found in the April number of this Journal for 1869, page 485.

Art. XXXIV. *Case of Gastro-enteritis from local Irritants simulating Cholera on two occasions in the same Individual*, by CHARLES MURCHISON, M. D. The first attack appears to have been brought on by eating cheese in a decayed condition and was characterized by symptoms approaching collapse, excessive vomiting, and purging of rice-water discharges, and cramps in the abdomen, legs, and feet. Appropriate treatment was adopted and the patient at once began to improve; but for thirty-six hours she passed no urine, and that obtained later contained albumen, which could also be detected two days later. The second attack seemed to be due to eating American lobster preserved in tin and was even more severe than the first attack, but the symptoms were essentially the same, including the suppression and albuminous condition of the urine. It is worthy of note that others had eaten both of the lobster and of the cheese without being affected thereby. The chief interest of the case is the analogy the symptoms bear to those of cholera, and in this connection the interesting paper of Mr. Sedgwick in the volume of the *Medico-Chirurgical Transactions* is referred to. See April number of this Journal for 1869.

Art. XXXV. *Three Cases of Phthisis with Contracted Lung*, by R. DOUGLAS POWELL, M. D. Dr. Powell gives the above name to a disease characterized by the contraction of the lungs, and believes it to be preferable to the name fibroid phthisis, which indicates rather a disease of constitutional origin, the cases of this disease which have come under his observation being on the other hand, due to local irritation and supervening upon the cessation of some acute affections, either simple basic pneumonia, pleurisy, or tubercular pneumonia of the apex. One lung is at first only diseased, but sooner or later the other lung becomes involved. Dr. Powell is, therefore, fully impressed with the extreme importance of bringing about complete recovery from acute inflammations of the lung or pleura before the patient returns to the ordinary avocations of life. Iodide of iron, and potassium, and cod-liver oil are the remedies recommended in this disease.

Art. XXXVI. *Statistical Analysis of Cases of Acute and Subacute Rheumatism, chiefly in reference to the Proportion of Cardiac Complications*, by THOMAS BEVILL PEACOCK, M. D. This paper contains the analysis of 146 cases of rheumatism treated by Dr. Peacock at the Royal Free Hospital and at St. Thomas's Hospital, being the greater number of cases treated by him from Sept. 1846, to March 1868.

The following are some of the most important of his conclusions: "Of the whole of the 146 cases of acute and subacute rheumatism only 84, or 57.5 per cent., or one case in 1.73, were free from serious cardiac complication, and of this number only 44, or 30.1 per cent., were entirely free from any signs or symptoms of heart affection, while in 40, or 27.3 per cent., there existed some slight signs or symptoms or both."

"The number of cases in which some decided form of recent cardiac complication occurred was 53, or 36.3 per cent., or one case in 2.75, while in 9 cases, or 6.1 per cent., there was old disease of the heart, making altogether 62 cases in which there was either old or recent cardiac complication, or 42.4 per cent., or one case in 2.3.

"There was not any marked distinction between the frequency of recent cardiac complications in the two sexes."

"Recent cardiac affections are, however, much more common in persons in early life than in older persons. In by far the larger number of cases in which recent cardiac complication occurred, the symptoms or signs or both were either commencing or actually present at the time of the patient's admission into the hospital."

"The result in the cases of recent cardiac complication depended very much upon the period at which the patients came under treatment for the rheumatic symptoms, and upon the time which had elapsed after the heart symptoms had made their appearance."

J. H. H.

ART. XXV.—*Transactions of American State Medical Societies.*

1. *Transactions of the Sixteenth Annual Meeting of the Medical Society of the State of North Carolina, held at Salisbury, May 12th, 1869.* 8vo. pp. 72.
2. *Transactions of the Twenty-fourth Annual Meeting of the Ohio State Medical Society, held at Columbus, June 8th, 9th, and 10th, 1869.* 8vo. pp. 179.
3. *Transactions of the New Hampshire Medical Society (Seventy-ninth Anniversary), held at Concord, June 15th and 16th, 1869.* 8vo. pp. 93.
4. *Proceedings of the Organization Meeting of the Texas State Medical Association, held in the City of Houston, June 15th, 1869.* 8vo. pp. 24.
5. *Proceedings of the State Medical Society of Michigan, for the years 1867-68.* 8vo. pp. 116.

1. THE usual Annual Address before the *State Medical Society of North Carolina* was delivered by Dr. R. H. WINBORNE. Its leading theme is "Professional Responsibility, Commensurate with the Progress of Science." The views of the author are sound and thoroughly practical. The proposition that in direct proportion with the improvement which has taken place in every department of medicine within the few past years, the responsibilities of the physician have increased, is sound, and must necessarily be taken into consideration in the establishment of an ample scheme of professional education.

An interesting case is related by Dr. C. J. O'HAGAN, of "Exsection of the Os Calcis," in which recovery with a useful foot ensued. The cause which required the removal of the os calcis was a carious condition of the bone consequent upon a gunshot wound received over two years and a half previously. The ball had entered the bone below and behind the right internal malleolus, passing directly through it at the insertion of the tendo Achillis, without doing much injury to the soft parts. In a short time acute inflammation of the ankle

joint set in, accompanied with profuse suppuration from the wounds inflicted by the ball; when it was decided to excise the injured bone. About three months subsequently to the operation there occurred an attack of phlegmonous erysipelas of the right foot and leg, attended with intense fever and great constitutional disturbance. As soon as the erysipelas was subdued, the wound promptly and permanently closed. Convalescence was uninterrupted, and for a year past the patient has been able to do all kinds of farm work. "He can follow the plough all day, and walk with scarcely a perceptible limp, which can, indeed, be entirely avoided by a proper pad within the heel of the shoe." "The power of the ankle-joint is unimpaired, the symmetry of the foot almost perfect, and the patient has now a good and useful limb, capable of all kinds of motion, including even those required in dancing."

A short paper by Dr. J. F. SCHAFFNER follows, giving an account of the "Topography and Diseases of Forsyth County," which is of too loose and sketchy a character to furnish any useful material illustrative of the difference or the identity in the etiology and pathology of diseases according to their geographical distribution.

The volume closes with the "Valedictory Address" of Dr. E. B. HAYWOOD, the retiring President, on "The Relations of the Physician to the Community and to the Law." This all-important subject is ably treated in a plain but pleasing style.

2. The first article which follows the Journal of Proceedings of the Session of 1869, of the *Ohio State Medical Society*, is the "Annual Address" of the retiring President, Dr. A. DUNLAP, which presents a very good, common-sense review of "the fair fields which the study of our profession presents for investigation."

Following this is a very valuable paper, by Dr. ROBERTS BARTHOLOW, on "Intra-cranial Tumours; their Symptomatology and Diagnosis, with Illustrative Cases." It is well worthy of a careful study. The symptoms produced by the presence of cerebral tumours, Dr. B. divides into two orders: 1st. Those common to intracranial morbid growths, or adventitious products in general; 2d. Those peculiar to tumours in special situations of the brain. Belonging to the first order are headache, vertigo, amaurosis, convulsions, derangement of the intellectual and affective faculties, etc.; to the second, alterations of sensibility, disturbances of the special senses, disorders of mobility, vomiting, urinary disorders, etc.

The next paper is by Dr. E. H. HYATT, on "Hæmatics." These he defines to be those medicines which act on the blood in the cure of disease. Of these he recognizes two distinct classes—RESTORATIVES and CATALYTICS. *Restoratives* act by supplying, directly or indirectly, a normal constituent of the blood, which, from any cause, has become wanting, or is rendered deficient in amount. Restoratives are *natural* to the blood, and hence will remain in it. *Catalytics*, on the other hand, act by counteracting or destroying a morbid material, or process, in the blood. They are *unnatural* to the blood, and hence cannot remain in it, but, sooner or later, must be eliminated and pass out of the body. The first only of these two classes of hæmatics is considered by Dr. H., in the paper before us, under the heads, first, of aliments, or those substances required as materials for growth, for the supply of waste, and for the maintenance of the several functions of the living organism at their healthy standard; 2d. Cod-liver oil; 3d. The mineral and vegetable acids; 4th. Vegetable tonics; 5th. Chalybeates, and, in connection with them, manganese, which is supposed to be a component of the colouring matter of the blood. The paper of Dr. H. is not devoid of interest. His views in respect to the action of hæmatics are, in our opinion, often problematic. They are based certainly upon no positive basis. In many instances, even although their correctness is far from being absolutely established, they are nevertheless, it must be admitted, highly suggestive.

Dr. A. B. JONES furnishes next a short paper on "Carcinoma Uteri," which presents nothing very novel or striking. We join heartily in the denunciation by Dr. J. of the various, often very severe and dangerous, operations suggested and actually performed by the heroic surgeons of modern times, the result of

which, so far as our experience extends, has been as often to augment the sufferings and shorten the existence of the patient as to suspend the disease or ameliorate the severe pain so almost invariably produced by it.

The paper next is on "Hypodermic Medication," by Dr. I. N. WEAVER. It does not present any very prominent views in respect to the exact value of the method of medication of which it treats, nor does it describe clearly the particular cases of suffering and disease to which it is best adapted.

Dr. A. D. WILLIAMS' "Report on Ophthalmology" is the next paper. The report is too short and superficial to do anything like justice to the several important subjects of which it professes to treat, or to convey to those who shall consult it correct views of the nature and treatment of some of the more prominent of the diseases of the visual organs.

Next in order is an interesting paper by Dr. ISAAC KAY, on "Fel Bovinum as a Medicine." The practical experience of Dr. K. with the ox-gall as a remedial agent has, he informs us, extended over a period of twenty years. He has given it in nearly every form of disease involving primarily the organs of digestion and assimilation. He has never been disappointed in any reasonable expectations he has formed of its remedial powers, where the object has been to remove or, at least, to ameliorate some prominent symptom or complication attendant upon dyspepsia. It generally corrects acidity of stomach and headache, while he has found it effectually to counteract habitual costiveness, when blue pill, castor oil, rhubarb, aloes, and other similar articles produced only a partial and transitory effect. He recommends the ox-gall, also, in the treatment of the obstinate vomitings and colics met with in young children, resulting usually from the firm, tough coagulation of the mother's or nurse's milk in the infant's stomach.

A short paper is contributed by Dr. J. B. HOUGH, to understand the true practical bearing of which, his remarks must be studied in extenso.

The volume closes with a "Report on Obituaries," by Dr. E. B. STEVENS, comprising short obituary notices of physicians of Ohio, whose deaths took place during the year 1868, and the first three months of 1869.

3. The seventy-ninth anniversary session of the *State Medical Society of New Hampshire* was opened by an address from the President, Dr. L. G. HILL, in which he gives a brief glance at "the labours and rewards of the physician."

A Report on Surgery is presented by Dr. L. B. HOW, which, though superficial, is characterized by much good sense.

The Annual Oration was delivered by Dr. W. D. BUCK. Its reputed theme is "Medical Progress," which, in the author's sense, is passed through in very rapid review; he certainly makes very little, if any, reference to those important points which would, by the great majority of readers, be considered as the chief items in "medical progress."

The volume closes with notices of recently deceased members of the Society, including a well-written and justly merited eulogium, by Dr. A. B. CROSBY, on REUBEN D. MUSSEY, M. D. Dr. M. was born in the town of Pelham, Rockingham County, N. H., June 23d, 1780, and died in the City of Boston, June 21st, 1866, in the 86th year of his age.

4. *Proceedings of the Organization Meeting of the Texas State Medical Association*, including the Constitution and By-Laws adopted for its government, an Address soliciting the co-operation of the Medical profession of the State, and the Code of Ethics of the American Medical Association. The State Medical Society of Texas has to all appearance been organized under most favourable circumstances. It depends altogether upon the zeal and fidelity of its members to render it an instrument of good to themselves and to the community at large in the midst of which it is located.

5. The Annual Address of the President, Dr. J. H. JEROME, at the opening of the session of 1868, of the *State Medical Society of Michigan*, is a neat and interesting production, presenting a sketch in outline of the history of the City of Detroit and State of Michigan during the last forty years; more especially in reference to its medical institutions, whether directed to the education of the

physician, or for the healing of the sick, the relief of the maimed, and the restoration of the blind, the lame, and the deformed; together with the present supply and standing throughout the State of its medical staff.

The *State Medical Society* was organized in June, 1866. In its first annual session, held June 5th and 6th, 1867, the minutes mention the reading of several reports and papers which do not appear in the volume before us, which contains only those which were presented at the session of 1868. The first of these is a "Report on Obstetrics," by Professor A. SAGER, M.D., which presents a brief, but very fair and instructive notice of the more prominent of the recent contributions to this department of medical science, especially from the learned and skilful teachers and practitioners of continental Europe. The histories of one or two interesting cases from the practice of Dr. S. are given in the report.

The next "Report," on "Diseases of Women," by Dr. E. W. JENKS, is in the form of a series of brief remarks on the diagnosis of "a class of disorders usually designated as Uterine Diseases." The remarks offered by Dr. J. on this subject, though very general in their character, are, upon the whole, so far as they go, pertinent and just. They point, however, to nothing very new or striking.

The "Report on New Remedies," by Dr. S. P. DUFFIELD, is short and unsatisfactory. The following paragraph embraces all of interest the report sets forth:—

"Among the new medicinal agents later than gelseminum, to which I called the attention of the Society at its last meeting, there has been brought to our notice, during the last year, by Dr. D. L. PHARES, of Mississippi, the *Viburnum prunifolium*—black haw—as an efficient remedy in cases of threatened abortion, and in uterine hemorrhages." Dr. D. made a fluid extract of the bark of the root, which was gathered in Canada during the fall of 1867. "It proved serviceable in a case reported by Drs. Pitcher and Farrand, when acetate of lead, the application of ice, and other of the usual remedies had been used without effect." "Several of our city practitioners," says the *Reporter*, "as also Dr. Snow, of Dearborn, have used it, and all of them, so far, bear testimony in its favour; sustaining the remedial virtues claimed for it by Dr. Phares. Its efficient principle is of a resinous character."

A report on the same subject is made by Dr. J. M. BIGELOW; it is entirely taken up with an account of a "New Preparation of Opium"—purified opium—said to be a combination of three soporific principles—morphia, narceia, and codeia.

In the next article the "Need of General Vaccination" is urged with becoming zeal, by Dr. H. F. LYSTER. The whole question may be thus concisely stated, the statement being based upon an overwhelming weight of testimony that no sane person can gainsay—Unless vaccination is universally, faithfully, and skilfully performed in a community, that community will be in danger of the occurrence in its midst, at longer or shorter intervals, of epidemics of smallpox with the inevitable concomitants of the disease, death or deformity; and, again, if vaccination be faithfully, continuously, and universally performed, and, when there is the slightest danger of the introduction of variolous contagion or infection, a prompt resort to general re-vaccination, will constitute an almost certain shield against the occurrence of smallpox in either its unmodified or modified forms.

Dr. E. P. CHRISTIAN furnishes a very sensible paper on the "Zymotic Diseases" of his vicinity. It shows that we are rapidly advancing towards a more intimate knowledge of the cause or causes of this class of diseases, and, in consequence, with a knowledge also of the proper measures adapted to their prevention, or to the circumscribing of the amount and area of their prevalence. The almost entire class of the so-called zymotic diseases are, it will, we think, be admitted, more susceptible of prevention or circumscription than of control, and, therefore, to be more successfully opposed by hygienic regulations than combated by physic. They are in fact more under the jurisdiction of well-devised and strictly-administered sanitary laws than under the prescription and administration of the best selected remedial agents. The paper of Dr. C. is

deserving of a careful study, even though the positive accuracy of some of its conclusions may be fairly doubted.

An instructive account is given in a paper by Dr. J. F. NOYES, of "Lachrymo-cystitis and Lachrymal Obstructions," with references to their treatment in ancient and in modern times, by incision and dilatation. Dr. N. believes, with Dr. Green, of St. Louis, that "by the method first instituted by Bowman, that is by slight incisions and moderate dilatation, a very large proportion of the cases of lachrymal obstructions as they occur in practice can be cured, and that only in exceptional cases is it necessary to resort to the more extended mutilations of the lachrymal passages."

Two short papers close the volume; the first, by Dr. W. H. DE CAMP, is on "Bending of Bones without Fracture," which presents nothing new; the subject, nevertheless, is of considerable interest. The second paper is by the same gentleman; it presents an account of "A New and Improved Method of Preserving Pathological and Anatomical Specimens." We give, as it is given by Dr. De C., the formula for his preserving fluid. The Latinity, be it remarked, is his. R.—Syrupus simpl. (saturated strength), aqua aā, O. i, alcohol, 95 per cent. f̄iv, acid carbolici ʒi.—M. After macerating the specimen in a portion of this fluid until the blood is all removed, it is to be immersed in a new portion of the same fluid for preservation.

D. F. C.

ART. XXVI.—*The Cell Doctrine: its History and Present State.* For the Use of Students in Medicine and Dentistry. Also a Copious Bibliography of the Subject. By JAMES TYSON, M.D., Lecturer on Microscopy in the University of Pennsylvania, and on Physiology in the Pennsylvania College of Dental Surgery; Fellow of the College of Physicians of Philadelphia, etc. With a Coloured Plate and other Illustrations. 12mo. pp. 150. Philadelphia: Lindsay & Blakiston, 1870.

THIS book supplies a recognized need, and supplies it completely; thus possessing a sufficient *raison d'être*, and much merit in addition. It requires little introduction but the record that its text faithfully fulfils the promise of its title. The author's plan is direct and satisfactory. Noting, with Huxley, that the microscope marked an epoch by enabling *proximate* physical analysis to become *ultimate*, he proceeds to divide the evolution of histology into *three periods*. These include respectively, the time prior to the discovery of the compound microscope; that between this event and the observations of Schleiden and Schwann (1838); and the time subsequent to these observations. The *first period* receives brief but appropriate attention, and the *second* has a larger space allotted to it in accordance with its greater relative importance. Here, as elsewhere, the author has shown much skill in condensing, and has succeeded in the attempt to be comprehensive, and yet keep his pages clear from the embarrassment of too many details. The references are very full, and each important view and discovery is properly placed in the series, with a notice proportioned to its historical value. Thus we have expanded accounts of the "fibre theory" of Haller, the doctrines of Wolf, the "globular" hypothesis, the "nucleus" discovery of Robert Brown, the "*crystallization vesiculaire*" of Raspail, and the steps which Purkinje, Schultz, Valentin, and Henle made upon the threshold of the great generalization without actually crossing it. But just regard is had to other labourers in the same field, and the contributions of each from Borellus, of Pisa, in 1656, are appropriately explained. This list includes many names in addition to those of Leeuwenhoek, Heusinger, Milne Edwards, Hodgkin, Dutrochet, and Wagner, with a passing tribute to the "philosophic mind of Bichat," who "elaborated his excellent classification," without making, however, many original investigations in minute structure, or "adopting any special theory of an ultimate physical element."

The remainder of the volume is occupied with the *third* or *modern period* of

histology; commencing with Schleiden and Schwann. There are no formal chapters, but the text is very conveniently divided by intercalated headings, in small capitals, giving the names and dates of the several writers whose doctrines are considered in chronological order. We shall not follow the author through the details of this *résumé*, but merely present a list of the headings. Schleiden and Schwann. Henle, 1841. Martin Barry, 1840. Professor John Goodsir, 1845. Huxley, 1853. J. Hughes Bennett, 1855. Todd and Bowman, 1856. Virchow, 1858. Sarcodæ of Dujardin: Protoplasm of Max Schultze. 1835-61. Dr. Beale, 1861; with the sub-heading, "The Cell, or Elementary Part in Disease." Robin, Pouchet, 1867. Huxley, 1869. The Author's Views.

The statement, as a whole, is very happily made, with the accuracy and spirit which attend only upon complete knowledge and ardent pursuit of a subject.

Dr. Tyson impartially expounds the teachings of the "physicists" as represented by Prof. Huxley, but himself adopts views which, in the main, correspond with those of Dr. Beale. This is "the result of careful comparison of the views of others," and of his personal observations, conducted for several years "chiefly in the direction of human physiology and pathology." He differs from Dr. Beale in claiming a frequently *granular structure* for the "germinal matter" which that discoverer describes as uniformly homogeneous, and in substituting the term "*non-germinal*" for "*dead*" in describing the "formed material." We entirely agree with him in the former position, and record at this point our belief that the French school of Robin, which is at present of necessity committed to the doctrine of "spontaneous formation as the prevailing mode of origin of the elements of tissues," will eventually find it possible to unite with others in more correct views, by the discovery of minute portions of granular germinal matter in the exudation-fluid, which they now regard as at first entirely "hyaline." It seems to us, in all probability, a question of lens-power, as was the discovery of the germinal elements of blood corpuscles in the serum. [*Microscope in Practical Medicine*. BEALE, 3d ed. p. 174.]

If it be necessary to make any change in Dr. Beale's nomenclature, "non-germinal" is no doubt the best; since "functional" would exclude the glandular products (bile, milk), and is, therefore, not coextensive with formed material. We feel somewhat jealous, however, of extending the term "living" to any matter (even to active muscle-substance and neurine) which does not possess the power of producing and reproducing.

The author has supported the records in the text by special foot-note references, and has introduced at the end of his book a copious "Bibliography." This is a very valuable feature of the work, and will be fully appreciated by his more advanced readers. *It occupies thirty-one pages, and contains nearly five hundred references.* There is no index or formal table of contents; but the distinct divisions of the subject-matter render these unnecessary.

A few unimportant errors scarcely mar the attractive typography, but we cannot approve the substitution of "mucous" for "mucus" corpuscles. It attributes to these corpuscles a quality which belongs only to the material of which they are structural elements, and does not indicate this constituent relation. A return to the original hyphen (disused by common consent) would be still better than the simple retention of "mucus."

The plate and illustrations are creditably reproduced, after Beale and Virchow, and make the contents intelligible to all. A mind introduced never so carefully, yet for the first time, to the "cell doctrine" as at present accepted, could not but have the subject somewhat nebulously before it, unless provided with a clearer account of its origin and development than has been heretofore easily accessible. By collecting in small space the various views scattered through many volumes, Dr. Tyson has lifted the mist and replaced the confusion by definite lines. The evolution of a great scientific doctrine assumes almost dramatic interest when skilfully pictured within narrow limits. Both teachers and students will find in this book a convenient chart of the all-important groundwork common to physiology and the processes of disease. The profession will be in every way benefited by its extensive circulation, and we espe-

cially suggest to the Faculties of our Colleges that they may, with advantage, place it in the lists of authorized text-books upon institutes and anatomy.

E. R.

ART. XXVII.—*Lectures on Surgery.* By JAMES SPENCE, F.R.S.E., Professor of Surgery in the University of Edinburgh, etc. Part II. 8vo. pp. xxii., 237–633. Edinburgh: Adam and Charles Black, 1869.

THIS, which is the only part of Prof. Spence's work which we have received, contains thirty-nine lectures, numbered Lecture XXXV. to Lecture LXXIII. inclusive, and is accompanied with an appendix of illustrative cases occupying over forty pages. It is likewise adorned with sixteen lithographic plates, some of which are coloured. The subjects discussed in the present volume are diseases of bones, including osteitis and periostitis, necrosis, caries, curvature of the spine (Pott's disease), rickets, and mollities ossium; diseases of joints, arthritis, ankylosis, hydrops articuli, loose cartilages, gelatinous degeneration, ulceration of cartilage, hip disease, excision of joints; affections of bursæ; fractures and dislocations; affections of muscles and tendons, wryneck, club-foot; injuries and diseases of veins, varix and varicose veins, wounds of arteries, the ligature, collateral circulation, torsion, acupressure, aneurism, etc. From this brief recapitulation, our readers can judge of the interest and importance of the topics concerning which our author writes, and it is needless to say that the opinions on these topics of a surgeon so eminent and so justly esteemed as Prof. Spence, must possess, as his opinions, a certain degree of value without regard to their intrinsic merit. We regret, however, to be obliged to confess that, in saying this, we have exhausted all the commendation which we can honestly bestow on the volume.

We look in vain for new information upon any points of surgical practice which are at present in dispute among surgeons, while the remarks upon those matters which have been long settled are at least neither clearer nor more forcible than are to be found in any of the text-books with which we are all familiar. Indeed, upon a good many topics of which we might expect to find a full exposition, our author manifests indifference, if not ignorance: thus, with reference to torsion, after a brief reference to its use by Amussat, Prof. Spence adds: "Torsion has recently been revived, and attempted to be re-introduced as a substitute for the ligature or acupressure. It answers well enough for small vessels, and I frequently use it. Past experience, however, has shown that we cannot safely trust to it in the larger arteries. In the present day the twisting is continued till the twisted portion comes off." Surely these sentences do not fairly represent either the practice or the recorded successes of the modern advocates of torsion, whether at Guy's Hospital, at Cambridge, or at Edinburgh. Again, with regard to dislocations, the following paragraph will scarcely convey any new information, at least on this side of the Atlantic: "Recently a procedure termed reduction by manipulation has been recommended by Dr. Reed (*sic*) of Rochester, U. S., and has proved successful in several cases." The treatment of fractured thigh by weight extension is not even alluded to, though one might think, since the publication of Dr. Harts-horne's researches,¹ that it was at least old enough to merit our author's attention. We might quote additional instances, but the above are perhaps sufficient; on the other hand, it is but just to say that the author's directions for treatment are usually judicious, and his theoretical views, if not quite up to date, such, probably, as will satisfy the majority of practical surgeons.

It is, perhaps, hardly fair to pronounce an opinion of a book which is not completed; but, judging from the specimen before us, we greatly fear that the

¹ See Nos. of this Journal for April, 1869, pp. 338–346, and for July, 1869, pp. 278–282.

publication of Prof. Spence's lectures will neither extend his own reputation, nor advance the cause of surgical science generally. The student will not obtain from them a just idea of surgery as it is, nor will the busy practitioner find them stored with either the learning of ages or the novelties of the day; we cannot commend Prof. Spence's work to our readers either as a text-book or as a volume of reference.

The book is very neatly printed, and some of the plates are really quite handsome illustrations.

J. A., Jr.

ART. XXVIII.—*On the Connection between Chemical Constitution and Physiological Action.* Part I. On the Physiological Action of the Salts of the Ammonium Bases, derived from Strychnia, Brucia, Thebaia, Codeia, Morphia, and Nicotia. By Dr. A. CRUM BROWN and Dr. THOMAS R. FRASER. (The paper for which the Makdougall-Brisbane prize was awarded; biennial period 1866–68). From the Transactions of the Royal Society of Edinburgh. Vol. XXV. Edinburgh: printed for the Society, by Neill & Co., 1868. 4to. pp. 53.

The Same. Part II. On the Physiological Action of the Ammonium Bases derived from Atropia and Conia. 4to. pp. 47.

This paper records an adventurous flight over regions previously beyond the most advanced outposts of scientific inquiry. Its learned authors have described their glimpses of possible generalizations with much moderation of statement; thus proving that they join to a spirit of zealous and ingenious research the judgment which imposes proper bounds upon theoretical speculation. Their chemico-physiological results are exceedingly curious, and certainly suggest the existence of a law, the definite enunciation of which is, however, wisely deferred until its scope and limitations become more evident. Their work has no immediate relation to therapeutics, but may eventually produce some valuable contributions to our materia medica.

There can be no reasonable doubt that a relation exists between the physiological action of a substance and its chemical composition and constitution, understanding by the latter term, the mutual relations of the atoms. Some observers have endeavored to connect physiological action with composition, looking for the cause of the peculiar action in the presence or proportion of particular elements. It is a sufficient answer to this to point to the totally different powers of many isomeric or polymeric bodies, as glycocoll and nitrite of ethyl; or to instance kakodylic acid, which is inert, although perfectly soluble, and containing more than 54 per cent. of metallic arsenic. *Composition* alone is an insufficient explanation: *constitution* must also be taken into account.

The direct way of investigation is impracticable, because the data are incomplete. *Constitution* involves not only *structure*, that is, the order of building up, or the arrangement of the equivalents in atoms and in mutually united pairs, but also what we may call the *potential* of each pair, or the amount of energy required to separate the equivalents from each other. The potential depends upon the structure, but cannot always be found from it, or expressed numerically; and we are ignorant of the structure itself in many cases, particularly of the alkaloids. It therefore occurred to Drs. Brown and Fraser that an indirect method might be found, resembling the mathematical *calculus of finite variations*. This consists in performing upon a substance a chemical operation which shall introduce a known change into its constitution, and then examining and comparing the physiological action of the substance before and after the change. This is capable of algebraic expression: thus, C = original constitution; P = physiological action. After the operation C becomes $C+dC$, and P , $P+dP$. Here dC , P , and $P+dP$ are known, and by applying the method to a sufficient number of substances, and by varying dC , we might hope to determine what function P is of C . This would be a strictly mathematical method

if we could express our known terms with sufficient definiteness to make them the subject of calculation. We may, however, be able, in an approximate manner, to discover the relation of P to C. The chemical operation selected must satisfy the following conditions: 1st. Be unambiguous, *i.e.*, produce a change of structure susceptible of only one interpretation. 2d. Produce in all cases the same change of structure, and, as nearly as possible the same change of constitution (including *potential*). 3d. Be completely under control, *i.e.*, not susceptible of spontaneous change within the animal body. 4th. Produce no change in the capability of being absorbed. 5th. Produce, in some cases at least, a decided change in physiological action. Chemical operations are of two classes: 1st, of substitution; 2d, of addition or subtraction. In the first, an atom or group of atoms is replaced by an *equivalent* atom or group of atoms, without any change in the active atomicity of any atom or radical in the substance. In addition (subtraction expressing the inverse operation), the active atomicity is saturated by atoms or radicals which are thus *added* to the substance. By *condensation* is understood the capability of being added to: and there are two kinds, *intra-atomic*, where the active atomicity of an atom, and *inter-atomic*, where the active atomicity of a compound radical is increased. Carbonic oxide is an example of the former; olefiant gas of the latter.

Operations of substitution frequently satisfy the first four conditions named above, but do not appear, with certain exceptions, to change materially the physiological activity of a substance. On the other hand, very decided changes of physiological activity, both in kind and in degree, are produced by addition; particularly where the condensation, diminished by the addition, is *intra-atomic*. The following examples illustrate this statement: Carbonic acid, hydrocyanic acid, arsenious acid, strychnia, and brucia, become respectively (when saturated by certain amounts of carbon, hydrogen, oxygen, and, in the case of hydrocyanic acid, chlorine) carbonic acid, hydrochlorate of methylamine, kakodylic acid, methyl-strychnia, and methyl-brucia. It will be observed that the former substances are highly poisonous, while the latter are either quite inert, or possess an action entirely different in kind from that of the bodies from which they are derived, and very much less in degree. The consideration of these previously isolated facts led Drs. Brown and Fraser to suspect that *condensation*, and particularly *intra-atomic condensation*, is in some way connected with physiological activity, as the first is, and the second appears to be, diminished or removed by chemical addition.

The occurrence, however, of saturated substances, such as alcohol, corrosive sublimate, and oxalic acid, having a well-marked poisonous action; and of condensed substances, such as benzoic acid, and salicine, which are comparatively inert, shows that condensation is not the only condition of physiological activity. But if the effect of condensation could be discovered and eliminated, the other conditions might be much more hopefully sought for. The authors turned their attention, in the first place, to the effect of chemical addition in altering the physiological action of the natural alkaloids. They were led to do so partly by the consideration that iodide of methyl easily renders the nitrogen of nitrile bases stably pentatomic, and partly by the hope, grounded on the observations of Stahl Schmidt in reference to methyl-strychnium and methyl-brucium, that marked changes of physiological action would be obtained.

The alkaloids are usually *nitrile bases*; that is, they contain one or more atoms of triatomic nitrogen directly united to carbon by three bands. This nitrogen can become pentatomic, as in the formation of salts. Thus in hydrochlorate of morphia, the nitrogen (of the morphia) takes up hydrogen and chlorine, becoming pentatomic, and being united by three bands to carbon, by one to hydrogen, and by one to chlorine. But it is not rendered permanently or stably pentatomic: it easily loses the hydrogen and chlorine, and returns to the triatomic state. But if, instead of an acid, we use such a substance as iodide of methyl, we find that the triatomic nitrogen takes up the iodine and methyl (as before the chlorine and hydrogen) and becomes stably pentatomic; does not lose these atoms even when subjected to attacks (by reagents) more violent than any to which it can be exposed in the animal system. This operation, then, the addition of iodide of methyl to nitrile bases, satisfies all

five conditions, even the uniform alteration of *potential*, so far as can be judged from a rough estimate of the heat produced by the change, and from the general character of the resulting substances. It removes, however, the condensation of the typical nitrogen only, and leaves any other condensation which may exist in the substance unaffected, so that it would be unreasonable to expect the new bodies to be quite inert. In the present paper, Drs. Brown and Fraser communicate the results of the application of this method to strychnia, brucia, thebaia, codeia, morphia, nicotia, atropia, and conia. They describe, in each case, the action of the alkaloid itself, the preparation and physical characters of the derivatives, and, in detail, their physiological action. The investigation was directed chiefly to the poisonous activities, and to the most prominent differences of action. The experiments, numbering two hundred and forty-four, were made chiefly upon dogs, cats, rabbits, and frogs. They were conducted with great care, and resembled those familiarly employed heretofore, in determining the properties of powerful substances, and in ascertaining the portion of the nervous system upon which they act. Having described the method at some length, we must pass over the details of the experiments with this indorsement of the manner in which they were performed, and add only an outline of the results. We cannot in every case accept without qualification the primary statements of the pure alkaloid action. They appear, however, to represent an average of received opinions.

Strychnia. One-twentieth to one fiftieth of a grain, subcutaneously administered, will produce in rabbits violent tetanic convulsions, and in a few minutes, death. It is almost undoubtedly established that these phenomena are due to a localization of its action on the spinal cord. Twelve grains of iodide of methyl-strychnium produced no appreciable result when thrown under the skin of a rabbit. Serious symptoms with recovery followed fifteen grains, and death did not occur until the dose reached twenty grains. One-tenth of a grain of strychnia administered by the stomach quickly produced death in a rabbit which had before taken thirty grains of iodide of methyl-strychnium in the same way without effect. The methyl derivatives of strychnia also possess a very different kind of action from strychnia itself, in fact, precisely the reverse. No starts, spasms, or slightest increase of reflex excitability. Paralysis, with perfectly flaccid muscles, instead of rigidity. In the autopsy the heart was found acting, the spinal motor nerves paralyzed, or nearly so, and no rigor mortis occurred for many hours. Further experiments demonstrated that the methyl-strychnium derivatives produce paralysis and death by destroying the function of the motor nerve end-organs, and that their mode of action is therefore identical with that of curare. It is difficult to imagine a more decided modification of action. The difference in power is indicated by the doses recorded above. Sulphate, nitrate, and hydrochlorate of methyl-strychnium vary in power, but their action is identical in character with that of the iodide.

Brucia. The action of this alkaloid is considered similar to that of strychnia, but less in degree. Analogous results were obtained by the iodide of methyl additions.

Thebaia. The most active toxic principle of opium has no soporific power, but ranks first among the alkaloids of that drug in convulsant action—lower, however, than brucia. Here, also, the same modifications in kind and degree of action follow the application of the addition method. Large doses are required, and the convulsant operation and effects upon the spinal cord disappear. We have paralysis of the motor nerve end-organs, and destruction of the conductivity of the motor nerves; the functions of the spinal cord and sensory nerves remaining intact. Idio-muscular irritability persists and rigor mortis is delayed.

Codeia. Second among opium alkaloids in toxic activity; a distinct convulsant, with feeble soporific properties. The methyl-derivatives rank themselves with those already described.

Morphia. Soporific largely in excess of its convulsant action.

Any conclusions drawn from experiments on such animals as rabbits with a substance whose predominating action is a soporific one, are liable to objection. Dr. Fraser accordingly took one grain of the iodide of methyl-morphium with-

out effect. The poisonous action of sulphate of methyl-morphium does not appear to be very different from that of a salt of morphia; but it does not possess in any degree the convulsant action of that alkaloid. Instead of convulsions, it produces paralysis, due to an effect on the motor nerves; the peripheral terminations being primarily involved.

Nicotia. Though the convulsant action of nicotia does not belong to its methyl-derivatives, these derivatives possess no paralyzing effect on the motor nerves. The change, therefore, is not the same as that in the cases above noted. There is some reason to believe that the convulsions following a dose of nicotia are not due to the same cause as those produced by strychnia. The activity of nicotia is greatly diminished by the methyl additions.

The change in the *character* of the physiological action is remarkably illustrated by strychnia, brucia, and thebaia, whose purely spinal-stimulant action is converted into a paralyzing influence on the periphery (end-organs) of motor nerves; it is apparent in codeia and morphia, whose convulsant action is also similarly converted, and whose hypnotic action is apparently altogether destroyed in the case of codeia, and certainly greatly diminished in that of morphia; and it is obvious, though less so, in nicotia, whose convulsant action is diminished or removed. We may conclude from these facts that when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare.

Iodide of methyl does not, when administered alone, produce any effects which can explain these modifications.

The experiments upon atropia and conia, and their derivatives, are very elaborate; but we shall omit any reference to them, because the starting point of original alkaloid action is, in the cases of these substances, as yet too complicated and uncertain to make the results of definite value. Enough has been presented to indicate that this ingenious line of investigation is probably a practicable one. It remains to show the results of removing the condensation of the other elements in the nitrile bases. The weak point of the inquiry seems to be in the as yet imperfect fulfilment of the second and fourth conditions of the chemical operation.

E. R.

ART. XXIX.—*Die Criminalistische Zurechnungs-fähigkeit. Kritik der Paragraphen 46 bis 52 des Entwurfs eines Strafgesetzbuches für den Nord-deutschen Bund. Unter Beisügung eines Ausdrucks der darauf bezüglichen Motive und Gutachten der Wissenschaftlichen Deputation für das Medicinalwesen.* Von J. VON ROENNE, Königl-Kreisrichter. 8vo. pp. 92. Berlin, 1870.

Criminal Accountability: A Critical Examination of the Paragraphs, 46 to 52 of the Draft of a Penal Code for the North German Union, with the Testimony in their Favour, as Respects their Medical Bearing, of a Scientific Deputation. By J. VON ROENNE, Royal Circuit Judge.

THE several questions discussed in the volume before us have a very intimate relationship with medical jurisprudence; for it must be evident that it is only to the educated and experienced physician that can be intrusted the solution of the inquiry as to whether the mental and moral condition of an individual accused of crime is such as to render him at all times cognizant of the nature and consequences of his actions, and to allow his will sufficient freedom and determination to keep him from the commission of crime.

All the points bearing upon the leading question of criminal accountability, and its extent in different individuals, under a variety of circumstances, are briefly but ably discussed, under the heads of age, congenital defects of mental power, or such as occur after birth, from the results of disease or injuries, direct or indirect, of the brain; defective or misdirected education; intoxication; long habits of intemperance; hallucinations; insanity; external influences, etc. etc.

The legal and medical jurisconsult will derive instruction from a careful perusal of Judge Von Roenne's critique of so much of the draft of a penal code for the use of the North German Union as relates to criminal accountability. Our laws do not, it is true, recognize the same number of grades of criminal accountability as are set forth in the draft of the proposed penal code for the "Norddeutschen Bund." With us the important question of moral and legal accountability, and when it often becomes the most difficult of solution, occurs in cases of indictments for murder in its higher degrees, and where a false judgment on the part of the medical witnesses may have the effect of consigning the innocent to an ignominious death or long confinement in the felon's cell, or to loose the guilty, and place at his mercy the lives of our citizens.

D. F. C.

ART. XXX.—*Researches on the Influence of Mental Activity upon the Excretion of Phosphoric Acid by the Kidneys.* By LUTHER HODGES WOOD, Ph.B., M.D., of New Haven. 8vo. pp. 18.

THIS thesis was awarded the Silliman Prize of the Medical Institution of Yale College, in the laboratory of which the researches were made.

The object of Dr. Wood's investigation was to confirm or refute an hypothesis advanced by Dr. T. R. Noyes in a paper upon the excretion of urea (*American Journal of Medical Science*, Oct. 1867, p. 345), in which are described certain experiments made to ascertain the effect of sleep on this excretion. Among other results Dr. N. found that the urine of the day was uniformly alkaline, and that of the night as uniformly acid; and this, even when the diet consisted of two precisely similar meals taken twelve hours apart. To account for this fact Dr. Noyes suggested that the causes of acidity were operating in both periods, and that the great increase of alkaline phosphates in the daytime overbalanced the acid reaction thus produced; the excess of the alkaline phosphates in the daytime being caused by the activity of the brain and nervous system during that period (p. 358).

The most marked result obtained in Dr. Wood's experiments, "is the great increase of earthy phosphates whenever mental activity is diminished. This fact is constant in the whole series. Both nervous and cerebral tissue are rich in phosphorus, and this when oxidized will yield phosphoric acid; hence, *ceteris paribus*, most phosphoric acid will be found in the blood, and consequently in the urine, when these tissues are most rapidly undergoing oxidation. From this it follows that if increased activity of the organs containing these tissues gives rise to increased disintegration and oxidation of them, the products of this oxidation would be increased in the urine; and hence, that the total phosphoric acid would be thus increased. But, on the contrary, if this activity consists in a more rapid growth and less decay of these tissues, then there would be found less phosphoric acid in the urine. The total amount of phosphoric acid excreted, however, does not appear, in these experiments, to be altered by changing the mental condition, sufficiently to draw any positive conclusions; but when it is separated according to whether it is combined with alkaline or with earthy bases, we find it to be greatly varied by changing the amount of brain work. If we assume that the *alkaline* phosphates result from this metamorphosis, then, since they are increased by study, the disintegration of nervous tissue would be correspondingly increased; while if the *earthy* phosphates have this origin, then, as they are diminished under these circumstances, there must be less oxidation of these tissues when the mind is actively engaged. Consequently it would follow that the same law which the researches of Dr. Noyes and Dr. Parkes have shown to be true of muscular tissue, namely, that it grows during a state of active exercise, is true also of nervous tissue.

Now, inasmuch as the alkaline phosphates are not increased in any proportion to the amount of increase of mental labour; while the earthy phosphates are diminished in a very much greater proportion by the same means; it seems

probable that the latter of these hypotheses—that mental labour diminishes the amount of earthy phosphates excreted, and consequently that nervous tissue grows when in a state of activity—is the true one.”

The results obtained by the author may be thus summed up:—

“1. The *amount of urine* excreted varies at different periods of the day, even on a fixed diet; the day-urine exceeds the night-urine in the ratio of 3 to 2. The largest amount is excreted during the forenoon, the next largest in the afternoon, then comes that of the latter part of the night, and lastly that passed in the early part of the night.

2. The *density* of the urine varies inversely as the amount of urine passed; the morning urine having a higher specific gravity than that excreted at night.

3. The *total amount of solids* excreted is greater during the day than during the night by nearly 50 per cent.; thus showing that the density is not diminished in proportion to the amount of urine passed.

4. The *reaction* of the day-urine is uniformly alkaline, that of the night-urine acid; while, however, acid urine is excreted during both periods of the night, it is the morning urine only that is alkaline, that of the afternoon being acid.

5. The *total phosphoric acid* excreted per hour on an ordinary diet, is largest during the day, rising highest after the principal meal; while on a fixed diet, the excretion is greatest at night, the maximum being reached during the first half of the night, the amount diminishing in the afternoon; it is less still at 7 A. M. and least at 1 P. M.

6. The *alkaline phosphates*, when an ordinary diet is taken, are greater by day than by night; on a fixed diet the reverse is true.

7. The *earthy phosphates*, on the other hand, are largest in amount during the day, both on ordinary and fixed diets.

8. The *total phosphoric acid* is very greatly affected by the amount and kind of food taken.

9. The *variations* in the amount of phosphoric acid, considered as a whole, are not sufficient to afford any indication of the previous mental condition.

10. The *alkaline phosphates* are only *slightly increased* on increasing the amount of mental labour.

11. The *earthy phosphates* are *diminished* under the same conditions, by an amount varying from 20 to 40 per cent.

12. *No such increase of phosphoric acid* as would be required by the theory of the disintegration of nervous tissue during action, was observed in these experiments.

13. The *alkalinity* of the day-urine is not due to the presence of alkaline phosphates in excess.”

This investigation apparently refutes the assumption of Dr. Noyes that the alkalinity of the day-urine is due to the great increase of alkaline phosphates consequent on the activity of the nervous system; moreover, under conditions of mental inactivity, our author found the alkaline reaction uniformly in the forenoon when the amount of alkaline phosphates is less than in any other period of the day.

Dr. Wood fails to give any explanation of the cause of this temporary alkalinity of the urine. We, therefore, must still adhere to the views advanced by Dr. Bence Jones,¹ founded upon a very careful series of experiments upon the reaction of the urine which seems to demonstrate its dependence upon digestion. He found that a notable falling off in the degree of the acidity of the urine occurred after food; that in healthy persons the urine may become neutral or alkaline shortly after the ingestion of a meal. These observations have been fully confirmed by Dr. Wm. Roberts, of Manchester, who attributes the “alkaline tide” after meals to the entrance of the newly digested food into the blood. Now as the alkaline bases largely preponderate in all our ordinary articles of food, a meal is *pro tanto* a dose of alkali, and must necessarily, for a time, add to the alkalescence of the blood, and as the kidneys have delegated

¹ Animal Chemistry. London, 1850, p. 41, and St. George's Hosp. Rep. 1869, vol. iv. p. 4.

to them the function of regulating the reaction of the blood, the urine immediately reflects any undue addition to, or subtraction from, the blood's proper alkaliescence.

Appended to Dr. Wood's paper are nine diagrams and as many tables which are intended to illustrate more clearly all the variations in the excretion of phosphoric acid observed in the analyses.

I. M. H.

ART. XXXI.—*Report of the Trial of Samuel M. Andrews, indicted for the Murder of Cornelius Holmes, before the Supreme Judicial Court of Massachusetts, December 11th, 1868.* By CHARLES DAVIS, of Counsel for the Prisoner, 1869.

THIS trial is particularly interesting to the medical public, only for the medico-legal question which it involved. The prisoner's counsel contended for his acquittal on the ground of insanity—that particular form of it called *mania transitoria*. In making this plea, they had the support of Dr. Edward Jarvis, who testified at the trial as an expert. On the other hand, Dr. Choate, Superintendent of the Taunton Hospital, who also testified, denied the very existence of any such affection, and his opinion has been warmly approved of, to some extent, by the public press. Since the trial, Dr. Jarvis has prepared a memoir more than twenty pages long, presenting the authorities in favour of *mania transitoria*, as an independent, well-marked, well-observed form of mental disease. This memoir was first published in the *Boston Medical and Surgical Journal*, and subsequently as an appendix to the printed trial.

The authorities there cited are numerous, embracing some of the strongest names in medico-legal science, and their testimony is remarkably conclusive. Of course, in such a work, nothing more could be done than to indicate with some particularity the various memoirs expressly on the subject, and the notices of the affection that occur in the more general treatises on insanity. It is sufficient, however, to place beyond a question the fact that this form of disease has been seen and described by various competent observers, and to an extent that excludes the idea of mistake. True, objections have been made, here and there, but they are rather against some accidental circumstances of the disease than against its essential character. Thus, Caspar, who expresses more dissatisfaction than any one, though it is not easy to see what it is all about, has related a case which he examined himself by order of the judicial authorities, and a more satisfactory case of *mania transitoria* is not on record. Unquestionably, the cases are comparatively rare, and a man may have thousands of cases of insanity under his observation without meeting one of this description, and yet that would not exclude the possibility of other men seeing it. Many a physician has never seen a case of pyæmia, or of Bright's disease, but one would only make a fool of himself by declaring that those diseases never existed. Many a surgeon has never met with a true union of the fractured neck of the thigh-bone within the capsular ligament; but who now doubts its possibility?

In a notice of this trial in the *Boston Medical and Surgical Journal* (Sept. 30), the writer finds much fault, both with Dr. Jarvis's opinion, and with the manner in which he has supported it. Yet, amidst it all, we fail to find a single valid objection, and we have read and re-read his remarks, to be sure we had not overlooked something which, by a stretch of indulgence, might be dignified with such a title. Why the article should have been written at all is among the incomprehensible things for which we are obliged to resort to that familiar solution of similar difficulties, that "it takes all sorts of people to make a world." In the intellectual world, blind credulity and thorough scepticism often travel the same road. By the side of the earnest inquirer properly appreciating evidence according to the approved rules of scientific investiga-

tion, we ever find some doubting Thomas who scouts any demonstration, however satisfactory, unless he can put his fingers, if not his foot, into it.

The reasons advanced by the writer in question against Dr. Jarvis's authorities have the merit of entire originality, if no other. One or two specimens, we apprehend, will be sufficient for our readers.

The authority of Esquirol is declared to be worthless, because, in the course of his inquiries he saw fit to change his opinions. In the early part of his career, he denied, chiefly on the ground of some metaphysical objections, the existence of homicidal insanity, as a distinct form of mental disease presenting no lesion of the intellect. Subsequently, compelled by the force of accumulated observations, he frankly admitted his mistake, and published a most satisfactory memoir on the subject. The very circumstance that gives additional weight to his authority, is supposed to destroy its value altogether. Having once embraced an error, the height of philosophy is to cling to it forever after in spite of the strongest evidence against it! But Georget, Marc, Castelnau, Devergie, Brierre de Boismont, Moreau de Tours, Delasiauve, Baillarger, Henke, Friedreich, Prichard, never changed their opinion on this point, probably, yet there is another reason for distrusting their authority, more potent than that. Here it is, in the writer's own words: "We must guard against the danger, great at the present day, of letting a high sounding foreign name go far as authority with us!" This is Native Americanism with a vengeance. We rubbed our eyes, wiped our spectacles, and read the passage a second time, before we were quite sure that we read it correctly, and then we wondered by what curious dispensation it had happened, that the writer who would have been a brilliant light among the Know-nothings, should have been born so far out of due time. His life must be a wretched one in these degenerate days. We suppose that on the occasion of the Humboldt centennial celebration, a few months since, when the people of Massachusetts—high and low, learned and unlearned, gentle and simple—were listening to that noble panegyric upon the great philosopher, from the lips of him of all others most worthy to receive his mantle, he retired to his room, and, like Jacob of old, rent his clothes, put sackcloth upon his loins, and mourned over the distinguished honors thus showered upon a couple of foreigners. Within our knowledge, such intense nativism has never been paralleled but once. An American youth of Irish parentage was once complaining bitterly of being flogged by his father. Not that it hurt him much, but it was the idea of "being licked by a d—d foreigner."

We hope that Dr. Jarvis will take an early opportunity to complete the list of authorities for this very important form of mental disease, and thus remove from every reasonable mind, any lingering doubt of its real existence. It would not convince those who refuse to believe a thing simply because they never saw it, but it could hardly be resisted by those who are satisfied with a kind and degree of evidence deemed sufficient for any other scientific truth.

There is another incident in this trial which a proper respect for our profession forbids our passing by unnoticed. It seems that the two experts disagreed upon a material point, whereupon Chief Justice Chapman, who presided on the bench, took occasion to decry the testimony of experts, and hold it up to public derision and contempt. This is a game much played of late by newspaper writers, but we hardly expected to find it in so respectable a quarter as the Supreme Judicial Court of Massachusetts. In the judgment of the Chief Justice, the testimony of experts is worthless, because it is not always unanimous. This, stripped of all circumlocution, is the essential argument. And a most extraordinary one it is, indicating, as it does, a curious misapprehension of the nature and purpose of medical evidence. He does not seem to understand that, in the very nature of things, the evidence of physicians as well as of all other scientific men, is liable to present more or less discrepancy. As long as the senses are imperfect, the judgment fallible, and new truth ever ready to reward the diligent inquirer, just so long will such evidence continue to be marked by discrepancy. The Chief Justice has imbibed the vulgar error that disagreement implies dishonesty, or ignorance, or jealousy, or all combined. He has never learned, apparently, that discovery, improvement, progress, which are

the true glory of physical science, are fatal to unanimity of opinion. Men look at the same thing from different points of view, under different lights; in short, with every variety of preparation, and thus it is that the same facts often present a very different signification to different men, though pursuing a common study. The conclusions of physical science do not follow one another like the successive steps of a mathematical demonstration, simply because they constitute a very different class of truths. Are we to believe that geology is but a tissue of idle fables, because on some important points scarcely two geologists agree? Are we to pronounce the astronomical researches of Kepler and Tycho Brahé to be utterly barren, because they differed respecting the Copernican system? Are the labours of naturalists no better than child's play, because of the world-wide difference between Mr. Agassiz and Mr. Darwin touching the origin of species? Even in pure mathematics we fail to find this new judicial test of fitness for the witness stand. In the course of a discussion on Quaternions, a few months since, in the National Academy of Sciences, did we not hear Professor Alexander dissenting most emphatically from the general conclusions of Professor Pierce? In fact, the most practical men, those who never venture a hair's breadth from the line of their own experience, are apt to differ as widely as others, when they undertake to generalize their knowledge. Who ever knew a jury of sea-faring men appointed to examine and report on the seaworthiness of a vessel, to reach an unanimous conclusion? And yet such a result is regarded as a proof, not so much of ignorance as of wide experience joined to rational caution, by those who would heap indignities on medical men who should, conscientiously and intelligently, differ as to the mental soundness of a given individual.

Such an estimate of the value of medical evidence given by experts comes with an ill grace from lawyers, with their proverbial experience of the uncertainty of their science, in spite of its accumulations of wisdom, of the severity of its logic, and the sagacity of its practitioners. Will the Chief Justice assure us that, a statement of facts being presented to any two distinguished lawyers, they would inevitably agree as to their legal significance? Is he disposed to abandon his profession as the prolific parent of error and disappointment, because of its conflicting authorities and overruled decisions? Do the mistakes and contradictions of ordinary witnesses, familiar enough to every practising lawyer, dispose him to believe that the practice of eliciting truth by oral evidence, is a sham and a delusion? We trow not.

But, we may be told that, admitting the correctness of the principle we contend for, nevertheless, scientific testimony is worthless as legal evidence. On the contrary, we declare that it is eminently valuable as legal evidence, because it touches important points that no other evidence can reach, and that without it the purposes of justice cannot be fully accomplished. The evidence of experts consists of opinions, they being exempted from the rule that confines other witnesses strictly to matters of fact. Of course, it is founded in fact. Certain facts being given, the expert is required to testify as to their significance; in other words, as to the practical conclusions which they warrant. Now, there is no reason why experts should display a nearer approach to unanimity of opinion on the witness-stand than the same men would anywhere else. They are required to bring, for the information of the court and jury, each the fruit of his labours in this or that department of knowledge. These several fruits may not be precisely alike, simply because the experience, learning, and sagacity of their producers have not been alike. And yet the testimony may be none the less applicable to its allotted purpose—furnishing information to the court and jury. One, for instance, as in the trial before us, testifies that transitory mania has been described by various well-accredited writers, from whom he has collected from seventy-five to a hundred cases. Another declares that he never saw an instance of it, although he has had between three and four thousand insane persons under his charge. These statements, far from nullifying each other, establish two important truths, viz., that the existence of transitory mania is placed beyond a reasonable doubt, and also that it is of very rare occurrence. Will any one contend that a verdict rendered without due consideration of both these truths, would be a proper one?

The objection takes another shape when it is charged upon experts that their discrepancies tend to confuse and distract the minds of the jury, and lead them to doubt and hesitate when they are expected to be prompt and confident. This is the effect, to some extent, with ordinary evidence, and yet, for all that, the good may greatly outweigh the evil. If the scientific testimony have substituted a reasonable doubt for misplaced confidence, then, certainly, it has done its legitimate work, and must be regarded as a blessing instead of an evil. When the merits of a case can be determined only by scientific evidence on questions still disputable among scientific men, owing to imperfect knowledge and limited powers, why should not the jury hear both sides. In so doing, would they not act precisely as they do in the ordinary affairs of life? Most men, before resolving upon any important movement, seek the counsel of others. The invalid labouring under an obscure disease is seldom satisfied with the advice of a single physician. The intelligent farmer, in some degree, at least, consults his agricultural paper, and observes his neighbours' results before deciding upon his own operations. The physician, before adopting a novel course of treatment, is careful to see the testimony both of its friends and opponents.

These alleged discrepancies of scientific evidence would be avoided, of course, by having but one expert in the case, but even if this were practicable in our modes of procedure, it would often fail to meet the purposes of justice. When we consider the progressive character of all science it can hardly be supposed that any individual, however diligent or gifted, possesses all the knowledge existing at present in the department to which he has been specially devoted. He may believe a fact which has been shown to be false, and seek to elicit truth by processes that have been shown to be fallacious. In short, he is human, and, therefore, is liable, not only to error in general, but to particular errors which might be corrected by others. The proof of this would seem to be too frequently exemplified in practice to require any formal assertion here. This course of employing but one expert, it is easy to see, would prove unsatisfactory in most cases, because the administration of justice is associated, in the Anglo-Saxon mind, with the idea of the largest liberty and the widest range in the introduction of evidence pertaining to the case.

The hostility so much manifested of late towards the evidence of experts can scarcely have arisen from even the slightest observation of its practical results. Take a case of no uncommon occurrence. A person is on trial for attempting to kill another by poisoning. A chemist has examined the contents of the stomach and found in them traces of the suspected poison. His reputation in this branch of science is deservedly high; he is confident of the sufficiency and correctness of his tests, and the jury are ready to convict on the strength of his testimony. Another chemist equally distinguished testifies that these tests, however satisfactory once, have been recently shown to be fallacious, and consequently, that the poison detected by the experiment may not have been taken by the deceased. The proper effect of this difference of opinion is a reasonable doubt on the minds of the jury, and they acquit the prisoner. Is there reason here for decrying the scientific evidence and holding it up to public scorn? Is the last-named expert to be blamed because he is thoroughly acquainted with the progress of his science—with its latest discoveries and improvements. Is the other to be blamed, because in the press of duties, a certain course of experiments, described in some journal of the day, has escaped his attention? The discrepancy, rightly considered, furnishes no occasion for blame of any one, but should make us rejoice that our criminal procedure is so ordered that all possible light may be thrown upon the question at issue—that every phase and aspect of the subject may be brought distinctly before the minds of the jury. A verdict arrived at in this manner ought to be satisfactory to the public, and, generally, no doubt, it is. Occasionally, the circumstances of a crime have so kindled the popular wrath that anything which stands between the feeling of revenge and prompt conviction is apt to be regarded with impatience and distrust. On a dispassionate consideration of the subject, however, few, we apprehend, will deny that where there is an intelligent difference of opinion on a question of science, the cause of even-handed justice requires the freest and fullest expression of that difference on

the witness-stand. The carping of thoughtless scribblers, or even of a judge on the bench, must not be mistaken for those matured conclusions of fair minded men which form the public opinion that is to endure. In this connection, we are reminded of the case of Thomas Smethurst, tried in London in 1859 for poisoning to death his mistress. Among the witnesses on each side was a host of experts—physicians and chemists—by whom every possible aspect of the case was presented. The jury convicted the prisoner, but his friends strongly appealed to Sir George Lewis, Secretary of State for the Home Department, to interfere against the execution of the sentence. As if the mass of scientific testimony already uttered was not sufficient, the Secretary concluded to ask for more, and accordingly placed the evidence in the hands of Sir Benjamin Brodie, soliciting his opinion respecting it. Acting upon his reply, the Secretary concluded to ask for a pardon, remarking that the necessity for advising this step had “risen from no defect in the constitution or proceedings of our criminal tribunals; it has risen from the imperfection of medical science, and from fallibility of judgment in an obscure malady, even of skilful and experienced practitioners.” The general acquiescence in the pardon of the prisoner was the result, no doubt, of the conviction that everything had been said that could be said, for and against him, without removing every reasonable doubt of his guilt. Just before the trial of Smethurst occurred that of Palmer, on a similar indictment, with a similar abundance of scientific testimony marked by similar discrepancy and conflict, and though subjected to the sharpest criticism, it was not made, so far as our observation extended, a matter of reproach or ridicule. Indeed, if scientific men may question one another’s opinions in treatises, and journals and debates, and be commended for boldness and freedom of thought, it is difficult to conceive why the same kind of independence on the witness-stand should be regarded as a fault or a folly. Medical evidence in cases of doubtful mental condition has been especially charged with contradiction and held up to popular reproach. Everybody admits the obscurity in which questions of insanity are often involved, and sees in it a fruitful occasion of diversity of opinion, and yet if the experts are not in strict accord with one another, the bench and the bar hold up their hands in a kind of holy horror at the unparalleled presumption, and proclaim such evidence to be totally unreliable. No range of experience, no abundance of opportunity, no endowment of sagacity, will excuse a man for seeing insanity, where others, with no such preparation, fail to see it at all. It is time such unworthy views were left where they belong—in the columns of the newspaper press—and that men with any pretensions to liberal culture, instead of indulging in jibes about medical theories and crotchets, should see, in the discrepancies of experts, the proof of thorough investigation, and an additional security against the conviction of the innocent, or the acquittal of the guilty.

To say, as we often hear it said, that juries should disregard scientific testimony altogether, and rely on proof drawn from other sources, is to strike at the idea which lies at the foundation of our whole system of criminal procedure—that the accused is to be regarded as innocent until proved to be guilty. Evidence against, is met by evidence for, him, and whether it has reference to matters of fact or of opinion, his right is the same under the law. It may be, indeed, that the essential point on which his fate is to be determined, is solely a matter of opinion. If the experts disagree, we see not the shadow of a reason why that fact should not appear in evidence, and inure to the benefit of the accused. Whether such disagreement is or is not creditable to experts, is a question utterly irrelevant to the subject, because it does not affect the competence of the testimony. The reputation of the experts is not to be confounded with the rights of the party on trial. Science must be taken as we find it, and if turned to the best possible account, we may be sure that its testimony will furnish safe and satisfactory ground for the verdict of the jury. “Not only is it possible,” says Mr. Stephen, in his *General View of the Criminal Law of England*, p. 213, “that juries should be able to deal with scientific evidence without special scientific knowledge; but experience shows that such evidence may be of the greatest strength.”

I. R.

ART. XXXII.—*Physical Culture in Amherst College.* By NATHAN ALLEN, M.D.
Prepared by the request of the Trustees. 8vo. pp. 46. Lowell, Mass., 1869.

DR. ALLEN very correctly remarks, that nearly all gymnasia connected with literary institutions, both in Europe and America, have failed to accomplish the results anticipated, because no system of exercises was adopted in harmony with the laws of the body, nor did the characters given them correspond to their importance, or require that daily regular training which was accorded to mental acquisitions. At Amherst, instead of leaving to students to exercise or not, at their option or convenience, without any guide, system, or instruction—the trustees determined, at the outset, to place the Department of Gymnastics in the position which its importance and success demand. To accomplish this object, two things were deemed indispensable: 1st, The living teacher—one thoroughly acquainted with the structure and functions of the body, with a knowledge of the laws of hygiene; and 2d, that physical training must be made a part of the regular exercises of the Institution, and must be stamped with the same importance, authority, rewards, and sanctions as are accorded to the other branches of study. In these features in the history of physical culture, as connected with large literary institutions, Amherst College, we believe, takes the lead. In fact, it is the first instance in the history of modern education where the claims of the body, its proper development and healthy training, have been placed upon the same platform, and the same importance attached to them, as to any other branch of study and of mental acquirement. At Amherst, to superintend the physical exercises, there is a well-educated and experienced physician, the appointed supervisor of the health of the institution—whose duty it is to lecture on health and hygiene; to forewarn students, collectively and individually, of the first symptoms or premonitions of disease, and whom they are at perfect liberty to consult in respect to all manner of weaknesses and complaints.

The gymnastic exercises of the pupils embrace a great variety of movements calculated to exercise every muscle so as to afford pleasure without fatigue.

Dr. Allen's estimate of the importance to the student of an appropriate and well-administered physical culture, is by no means exaggerated. That there is a most intimate and necessary connection between the improvement of the mind and the culture of the body all will admit. It is now pretty well established by the highest authorities in medical science, that the brain is, in some sense, the organ of the mind—that all mental manifestations in this world depend very much upon the size and quality of the brain, and the various agencies affecting its functions. If, therefore, all intellectual culture is not only dependent upon, but, in a great measure, controlled and limited by certain physical conditions, it is of the highest importance, in the course of a liberal education, to understand what these conditions are, and to be able to turn them to the best possible account. And it is not alone the relations which the brain itself sustains to the mind that are important, but those are equally so, in some respect, which it bears to other parts of the body. It is well known that the mind is sometimes greatly affected by the state of the stomach, the liver, and the digestive organs generally. In fact, there can scarcely be an abnormal condition of any organ in the human body that will not exert some influence upon the mind. Now, while the primary object of gymnastics is to facilitate, in the highest degree, mental culture for the time being, they tend also, when properly conducted, to prevent disease by checking, or removing in their incipient stages, those weaknesses or predispositions, which, if neglected, will inevitably terminate in actual disease. To do this successfully, every tissue and organ must receive its due proportion of exercise, not only in harmony with the laws that govern its own functions, but with the laws and functions of every other portion of the system.

The human body, in its normal or most healthy condition, may be compared to a perfect machine, made up of a great variety of parts, each performing its own appointed work, and not interfering with the functions of the others, so that the wear and tear will come upon all parts of the organism alike.

There are several modes or kinds of exercise in popular use, which, however otherwise allowable, are open to the objection, that they develop and strengthen mainly the extreme portions of the body. Health and strength are not synonymous terms. A person may have great strength of his limbs, or of certain muscles, but not have really good health. It is altogether a mistaken idea to suppose that physical culture has for its sole object the development of strength. There are other tissues and organs in the human system beside the muscular. The healthy action of the lungs and stomach is far more important than great strength in the arms, legs, or back. It is in the general exercise of all the muscles, and of every portion of the body, that the system of gymnastics advocated by Dr. Allen has its great excellence. It aims to produce just that development of the human system upon which good health is permanently based, described by a distinguished writer thus: "Health is the uniform and regular performance of all the functions of the body, arising from the harmonious action of all its parts—a physical condition implying that all are sound, well fitting, and well matched. Some minds do not look far enough into life to see this distinction, or to value it if seen. They fix their longing eyes upon strength—upon strength *now*, and seemingly care not for the power to work on; to work well; to work successfully for years to come, which is health."

In whatever point of view contemplated, physical culture is a subject of vast importance—as much so as mental culture. We have been greatly pleased with Dr. Allen's account, as given in the work before us, of the very excellent plan upon which it is conducted at Amherst College. In our account of the doctor's exposition of this plan, and its advantages, we have made use pretty much of his own language.

D. F. C.

ART. XXXIII.—*A Contribution to the Physiological Study of Veratrum Viride and Veratria.* By R. AMORY, M. D., and S. G. WEBER, M. D. 12mo. pp. 66. Boston: David Clapp & Son, 1869.

THIS pamphlet is a reprint from the *Boston Medical and Surgical Journal*, and contains the records of a number of very carefully conducted experiments made with veratrum and veratria upon the lower animals. From these we learn that among the earliest effects noticed were salivation, vomiting, and purging; later the respirations were hurried, muscular actions imperfectly performed, and the urine was ejected violently, in consequence of spasm of the muscular walls of the bladder; the secretion of the kidneys did not appear to be affected. Death in most cases was preceded by tetanic spasms. The vomiting, purging, and salivation were not due to the local action of the drugs—for they all occur when they are administered hypodermically—but to an irritation of the nervous periphery transmitted to the nervous centre, or of the nervous centre itself.

No lesions of the brain or stomach were detected at the autopsies. The right side of the heart was generally found congested; the lungs presented ecchymoses, or a marbriform appearance; the muscles retained their contractility, but no contraction was induced when the nerves going to them were stimulated. Rigor mortis occurred early, and this shows the loss of equilibrium between the muscular and nervous vitality. The final conclusion of the experimenters appears to be that "veratria causes by its absorption, in a way we cannot now define, a paralysis, or suspension of the function of the spinal axis, or of the peripheries and termini of the nerves, and if carried to a certain extent, prevents the vital functions from being carried on, from which death results." They consequently reject Prevost's opinion that veratria acts directly upon the muscular tissue through the blood.

J. H. H.

ART. XXXIV.—*The Student's Guide to Medical Diagnosis.* By SAMUEL FENWICK, M. D., Physician to the London Hospital, etc. etc. 12mo. pp. xvi., 176. London: John Churchill & Sons. 1869.

STUDENTS when brought for the first time face to face with disease are very apt to find that the knowledge gained in class rooms fails them, and that even where the symptoms are prominent it is by no means always easy to trace them back to their source, and consequently frequently impossible to recognize the disease they have to deal with. This difficulty is of course very much increased if the characteristic symptoms of the affection be wanting, as happens not infrequently in pleurisy and peritonitis. With the view of diminishing the embarrassment of the student, Dr. Fenwick prepared a series of rules for diagnosis, intended at first only for the members of his own class at the London Hospital, and arranged in such a form that they might be kept at hand, consulted and referred to in cases of difficulty and doubt; at the suggestion of numerous friends, however, the idea was elaborated, and hence the book the title of which leads this notice. The first few pages are devoted to an introduction, in which some general rules for the proper examination of patients are given, and the great advantages of the study of diagnosis properly impressed upon the student. As an instance of the danger of treating symptoms without reference to their causes, the frequent symptom of pain in the head is referred to. Now this may arise simply from caries of a tooth, from constipation, from inflammation of the pericosteum, from neuralgia; or it may be symptomatic of an incurable disease of the brain; and it is evident that a treatment admirably adapted for one of these conditions would be absolutely nugatory or positively injurious in one of the others. Diagnosis, however, in addition to indicating the cause of symptoms, enables us almost always to foretell the cause of a disease, and to form a prognosis as to its termination. "The plan of diagnosis," and we are now quoting the author's words, "adopted in the following pages has been to divide all the diseases of each organ into groups, by fixing upon some well-marked character, which is presented by some in common, but is wanting in others; and in the same way to divide and subdivide each group. Thus, the diseases of the liver are first grouped into acute and chronic affections; the latter are again divided, according as the organ is enlarged or diminished in size; and the enlargements are further subdivided into those in which there is, and into those in which there is not, either pain or tenderness on pressure."

This plan is the one adopted and first fully carried out by Dr. J. M. DaCosta in his work on "Medical Diagnosis," to which work this little book bears a very strong resemblance in its general arrangement. We must admit, however, that the intention of the author that the book should be a guide to the novice in his study of disease has been well carried out, and it will be found especially useful to the American medical student, so much of whose instruction is didactic in its character, and so little derived from bedside observation. Its size, moreover, admits of its being conveniently carried in the pocket, and it is therefore admirably adapted for frequent reference. As a complete work on Medical Diagnosis, it is scarcely necessary to say that it will not compare favourably with the excellent work already alluded to, or with those of Racle and Barclay. The book is illustrated with several wood-cuts, and is well printed. J. H. H.

ART. XXXV.—*The Pathology and Therapeutics of Mental Diseases.* By J. L. C. SCHRÖDER VAN DER KOLK, Professor of Physiology in the University of Utrecht. Translated from the German by JAMES T. RUDALL. 8vo. pp. 158. London: John Churchill & Sons. 1869.

THE Low Countries have not been famous of late years for their contributions to our stock of knowledge, for the Latin, once exclusively used by their learned

sons, is now practically dead, and their mother tongue is little known beyond their own narrow bounds. But, though literature is national, science is ever cosmopolitan, and so a waif from their shores occasionally reaches us, to remind us of those days when they were the chosen abode of science—when Huyghens, by his achievements in astronomy, geometry, optics, and mechanics, made himself the worthy precursor of Newton, and Swammerdam revealed the wonders of the insect world, and Leeuwenhoek demonstrated many curious facts in the circulation of the blood, and Boerhaave reigned like an autocrat in the medical schools of Europe.

The author of the work before us was physician of a hospital for the insane at Utrecht, and this is the fruit of his observations and studies while holding that office. Although touching upon all the points usually presented, it has neither the rounded proportions of a systematic treatise or text-book, nor much claim to the character of a work of original research and discovery. Still, as the production of a careful, intelligent, pains-taking observer, it will not be without its value to the psychological student. The first hundred pages are devoted to the Physiological Anatomy of the Brain. They add little if anything to our knowledge of the subject, and might well have been compressed into a smaller compass without material loss. Though free from the transcendentalism of his German neighbours in this branch of medical science, he does not entirely refrain from a spirit of speculation, which, however harmless to the veteran inquirer, is calculated to mislead the inexperienced student. Besides describing the minute structure of the brain as revealed by the microscope, he indulges in a course of remarks respecting the functions of the various parts, which might be mistaken for generalizations of established facts, while they are really pure speculation. Thus, in common with most physiologists of our time, he believes that the cells of the cortical portion of the brain are the seat of the higher mental operations, but in saying that the will is exerted by means of the *corpora striata*, he is unsupported by a single fact. The only direct evidence on the point, the removal of these parts by Schiff, convinced him (Schiff) that they had nothing to do with voluntary motion. In allotting to the mind and to the cortical cells their respective shares of duty in producing the mental manifestations, he is led into that confusion of ideas which is sure to follow any attempt of this kind. The question that puzzles him is, whether the mind acts on the *corpora striata* through the cortex of the brain, or directly on those bodies, but he rather thinks the latter is the fact, because the removal of the hemispheres does not deprive the animal of all free will. He thinks "the anterior lobes of the brain act in a plastic manner, provide material and images for thought; the upper and hinder lobes contain cells for feeling, and mediate peculiar impressions which touch more the disposition and belong to the instinct." It seems very like a foregone conclusion, therefore, when he states that "in insanity proper, in case of confusion of ideas, and of haughty insanity," he has always "found the anterior lobes suffering, but, on the contrary, in the melancholic and those who condemned themselves, with or without religious admixture, he has found the upper and posterior parts of the lobes diseased, and that in the latter cases the understanding often showed no trace of disturbance, inasmuch as the individuals judged correctly and disputed acutely." Surely he must have met with cases not of a melancholy character but quite otherwise, where the patient judged correctly and disputed acutely.

The chapter on the Pathology and Therapeutics of Insanity is vitiated by the same fault of adopting conclusions on the strength of some fancied analogy or plausible conjecture, rather than any positive evidence. He makes two divisions of insanity, idiopathic and sympathetic, the latter embracing a large proportion of the cases, and distinguished from the former in their mental and physical traits and the means of treatment. That disorders of other organs may, occasionally, be an exciting cause of insanity, nobody doubts, but it certainly is news to us to be told that the disease thus produced is essentially and necessarily different from insanity produced by other causes. Our author's doctrine is, that idiopathic insanity is characterized by excitement, exaltation, turbulence, self-satisfaction, a quick pulse, and sparkling eyes, while the sympathetic is marked by more quiet, depression, unhappiness, seclusion, sadness,

and despair. This doctrine is the complement, apparently, of that just noticed respecting the cerebral seat of different forms of mental disease. We hardly need to remark that the one has as little foundation in nature as the other. Our author himself, we venture to say, would have found it impossible to distinguish among a crowd of patients the idiopathic from the sympathetic cases, even though aided by a history of all the symptoms. We have no reason to believe that insanity does not imply the same structural change, whether caused, in the ordinary use of the term, by a blow on the head, a disappointment in love, suppressed menstruation, or torpor of the liver. Nor have we observed any uniformity of relation between the mental manifestations of the disease and its exciting cause.

That there is a more constant and intimate connection between insanity and diseases of other organs than the profession has been in the habit of thinking, we do not doubt. The fact has been established by the increasing practice of examining the bodies of the insane, and we are glad that our author has drawn attention to this complication. In no other organ is this connection more frequently witnessed than it is in the lungs, and the more extensive our researches the larger we find to be the number of those dying of chronic insanity, who present some pulmonary lesion. Even in the early stages of mania such lesions are not unfrequent, the cerebral masking the pulmonary affection to the very last, or interchanging periods of activity, so that one year the patient seems to be dying of consumption, and the next of mania. The practical importance of knowing this complication can scarcely be over-estimated, for mistakes respecting it may become a source of great disappointment and grief.

In the description of acute mania there occurs a remark which shows that the author had no very exact conception of that organic movement which constitutes the initial stage of disease. "Our intellectual faculties," he says, "our judgment, must not be, if I may so express myself, identified with the operations of the brain, with the power of the brain. If our understanding, our judgment, resulted from the operations of the brain without anything further, then indeed such patients, by the prevailing excitement of the brain, must become more intelligent; their judgment must be sharper and deeper; in a word, their intellectual powers must be elevated. But the very opposite occurs." Not unfrequently the very opposite does not occur. On the contrary, we do not understand how any one can be much conversant with insanity without often seeing in the forming stage, and even through the whole course of some forms of the disease, the intellectual processes quickened and intensified, and manifested with a degree of energy and acuteness scarcely known in the normal state. This is strikingly true very frequently in what is called circular insanity, much to the bewilderment of courts and juries, and all those worthy people who live and die in the belief that it is wrong and deserving of condign punishment to treat any person as insane who answers a question acutely and converses coherently and correctly. It can scarcely be doubted that the initial movement in the process that ends in insanity is precisely that very quickened activity and exaltation of cerebral power which is essential to great intellectual effort. This is the testimony of common observation, for in all ages it has been believed that "great genius is to madness near allied." We do not mean of course, as our author seems to, that insanity consists solely in that kind of organic excitement which passes under the name of irritation in one stage, and inflammation in another, and which may be induced indiscriminately by moral or physical agencies. Underlying all those adverse influences that figure among the "causes of insanity" is something in the very constitution of the brain whereby these alleged causes are enabled to produce any mischievous effect. This fact would seem to be apparent to any one who carefully ponders the question why a disease so specific in its character as insanity should be caused by such diverse agencies as a suppressed secretion, intemperance, onanism, turn of life, loss of property, family jars, religious excitement, unrequited affection, and the death of friends. Unless he ignores the first principle of science that like causes produce like effects, he must admit that these are only casual incidents attending the development of a specific, homogeneous condition. Had our author looked at the matter in this light, he would scarcely

have assigned to bodily ailments so large a share in the production of mental disease.

It is this grand mistake probably which has led him to that enormous use of remedies in which he might have safely claimed pre-eminence over every author of our time, or indeed of any time. Starting with the assumption that bodily disease is a common cause of insanity, he readily reached the conclusion that in order to remove the latter, the first step should be the cure of the former, and having great faith in the efficacy of drugs, he had only to make a generous use of these to accomplish the purpose. But with that kind of inconsistency not uncommon with men who are governed by a favourite idea, he outstrips the course of his logic, and concludes that what succeeds so well in one form of insanity may be the best possible thing in another; and so he finds that the whole field of mental disease, idiopathic and sympathetic, acute and chronic, mania and dementia, is filled with foes that must be driven away by the fiercest agents that the shop of the apothecary can furnish. We confess it almost took away our breath to witness the furious onslaught thus made on the whole tribe of mental disorders. It certainly was no rose-water affair. In the performance of this duty he meant business. His favourite weapon was tartar emetic, inside and out, used to the utmost point of tolerance, week after week apparently, but exactly how long does not appear. He often used local bleeding, issues in the neck, varied by setons and blisters, moxa on the top of the head, and crucial incisions on the same, in which a few peas are inserted. These last-named applications he had found particularly serviceable in hallucinations, which they often cured. These, he says, are often caused by congestions of the optic nerves or of the corpora quadrigemina, and they disappear after cupping the back of the neck, or after other derivative measures, meaning probably moxa, blisters, tartar emetic ointment, and incisions. If tartar emetic internally is not well tolerated, then he resorts to sulphate of copper, "by the use of which," he says, "I have nearly always seen the appetite return," and that failing he employs sulphate of zinc. In connection with these things, "cold applications to the head are indicated; or, according to circumstances, ice, douches, drip, or shower-baths to the head, or even together, with the influence of cold to the head, simultaneously warm general baths or foot-baths. Leaven may also be useful. Vesicatories, on the other hand, require some prudence." All these, be it considered, are used without reference to the duration of the disease.

Our author believes that in idiopathic as in sympathetic insanity, there is often "a spasmodic contraction of the descending colon." This condition, he says, often passes into "elongation of the colon," as a result of long-continued constipation. Either by way of cure or prevention, we are not quite sure which, he relies with childlike confidence on the *Rhamnus frangula*, in decoction, though resort must sometimes be had to the sharper weapons, aloes and croton oil. In cachectic conditions his sheet anchor is *Flores arnicæ*. If matters get worse, then resort must be had to *Radix arnicæ*, "that excellent remedy on which physicians usually do not bestow due consideration, especially in practice among the poor." When the case looks desperate, the *Flores* and the *Radix* are to be combined. When paralysis is threatened there is nothing better than *nux vomica*. The amenorrhœa, which is so common a trouble with the female insane, is not to remain undisturbed, although, as he says, "we are much in the dark in respect to emmenagogues." Whether an ample choice of selection is to be taken as an equivalent for this darkness or not, our author's armory furnishes such an array of weapons for the service that we are quite distracted by an *embarras des richesses*. Savine and aloes are a matter of course, but our author has "seen the most brilliant result from cupping with scarification in the lumbar region." Electro-magnetism and leeches to the labia are not to be despised, but, he adds, "among the most powerful means is the cupping-boot of Junod." "Its use in private practice," he says, "is not easy. Perhaps the boot might be in some degree replaced if one were for a short time to apply a tight ligature round the thigh and through it keep the blood back in the leg."

It would be hardly worth our while to comment on such kind of medication. The time has gone by, we trust, when there was any danger of its being followed. It is the legitimate result of that old pathology of insanity which made

it consist solely of inflammation, and which, long after it had been numbered among the curiosities of medical experience, has in some mysterious way been adopted by our author. The fact may be accounted for in some measure perhaps by the circumstances under which he observed the insane. He met with them associated together in large numbers, in establishments very like general hospitals in their construction and service, all of them victims of disease, and consequently subjects of medical treatment. Once a day perhaps he passed through the wards, his attention being given to those chiefly who seemed to require medication, and when the requisite amount of blood had been drawn, and a *quantum sufficit* of pills and powders and draughts were ordered, his work was done. Practically the mental condition was almost entirely ignored. What is called moral treatment, and which now is regarded as of paramount importance, was quite beyond the sphere of his duty. Even had he recognized the importance of those appliances that are made directly to the mind, he could have used them only on the most limited scale. In a large, crowded establishment, in the midst of a populous city, with no land except some dreary courts in which a few half animated beings exposed themselves to the sunshine, there could be used none of those means for exciting a healthy mental activity which constitute the honor and glory of modern asylums for the insane. And thus it is that in this whole book not one word is said about the things pertaining to moral treatment. Had the author been the resident physician of an establishment in the country, mingling freely with his patients, learning their history, following the course of their malady from day to day, and watching the healthful influences of surrounding nature, we should have heard much less of cupping and tartar emetic, and something of employment, labour, amusement, and mental occupations.

For many of the imperfections of the present work, the author should not be held to a very strict account. It was left by him in manuscript when he died in 1862, and translated by some pious pupils from the Dutch into German, and thence into English. We gather this much from the preface, which, however, is so blindly written that we hardly know what to make of it. The English translator may have rendered the sense of the author, but beyond this he can be allowed no claim whatever to merit. His language is often as destitute of idiomatic expression as the first exercise of a schoolboy in construing his Livy or Virgil. The following sentences are specimens of a multitude of others: "This occurs in a still higher degree with constipated bowels and so-called obstruction, at the ground of which, as I shall afterwards show, strictures of the large intestines lie." "Such a patient will, according to his disposition, seek to explain the manner in various ways, but he mostly runs into attacks on his emotional life and self-reproaches," p. 55. The phrases and turns of expression which have become familiar to the English medical reader are singularly ignored by the translator. Thus, throughout the whole book, without a single exception, the word *section* is awkwardly used in place of *autopsy*. All this shows, what many people forget, that to translate from one language into another something more is required than a competent knowledge of the original. Unless by means of some practice in writing one has gained a certain command of language, enabling him to recast the thought in his own vernacular, his work will be but a poor performance.

I. R.

ART. XXXVI.—*A Manual of Clinical Medicine and Physical Diagnosis*. By THOMAS HAWKES TANNER, M.D., F.L.S., etc. Third American, from the second English edition. Revised and enlarged by TILBURY FOX, M.D., Lond., Physician to the Skin Department in University College Hospital. 12mo. pp. 366. Philadelphia: Henry C. Lea, 1870.

DR. TANNER is a skilful and industrious compiler, and a good practical observer; and, of all his works, this has best met its purpose of usefulness.

By avoiding the domain of therapeutics, and, mostly, that of pathology, he has been able to give a systematic view of the methods, as well as the field, of medical observation, in small compass, and of great value to the student. The revision and enlargement of the second English edition, by Dr. Tilbury Fox, have been accomplished fully upon a level with the character of the original work.

Such a book is of service during a course of medical study, in two ways. One is, the aid given at the bedside, in the dispensary, or in autopsic examination, to the actual exploration of disease and its results. The other, is an increase of the student's acquaintance with those salient ideas, whether of positive fact or of current theory, which constitute almost the alphabet of medical science, and with which every physician should be familiar. As the first edition was published in 1855, it is of some interest to notice what have been the principal additions made necessary by the progress of clinical medicine since that time. As such, we may enumerate laryngoscopy and rhinoscopy, the use of the hypodermic syringe, extension of the applications of the ophthalmoscope in diagnosis, improvements in the use of chloroform by inhalation, notice of the influence of dampness in producing phthisis, the definite use of the thermometer in diagnosis and prognosis, the sphygmograph, embolism as a cause of cerebral disease, cerebro-spinal meningitis, and locomotor ataxy. *Aphasia*, very singularly, is not named at all in the book. The most important contributions of Dr. Fox to this edition are more than thirty pages of new matter concerning the diagnosis of abdominal and cerebral affections, and a considerable modification of the chapter on Skin Diseases; besides minor but important additions, above mentioned. We find, also, extension of the instructions concerning the English law in regard to insane patients, and of that upon the subjects of life insurance, medical evidence in cases of shock from railway accidents, compulsory vaccination, and feigned diseases. There is considerable extension of the section upon Medical Anatomy; and the diagnosis of exophthalmic goitre, or Graves' disease, is briefly mentioned, having been omitted from the previous edition. We are glad to see credit given to Dr. Bowditch, "of America," for his share (with Dr. Buchanan) in the inquiry into the relation between dampness of soil and the prevalence of consumption; although it would have been in place also to allude to the importance, amply shown by MacCormac, Parkes, and others, of *foulness* of atmosphere in the same causation.

In the chapter on the Diagnosis of Skin Diseases, while a considerable amount of valuable information has been added by Dr. Tilbury Fox, with whom the subject has been one of special study, we are unable to see that the *classification* has been much, if at all, improved. Is there, for instance, good reason for calling *lepra* a *diathetic* disease, while *eczema* is regarded as only a local inflammation? Yet more doubtful seem the subordination of *impetigo* as merely an incidental stage or variety of *eczema*, and the designation of *herpes* as one of the "*neurotic*" affections. In fact, the genius of Willan laid so good a foundation for dermatological classification, that those who have followed him have done, in most cases, the best service when they have, without abandoning his plan, simply added or made emendations in accordance with the progress of knowledge.

The chapters on Entozoa, and on the Chemical and Microscopic Examination of the Blood, Urine, etc., have been well brought up, by Dr. Fox, to the present state of science: although (as a minor point) a sufficiently definite account is not given of the determination of the presence, under some circumstances, of *spermatozoa*, and of their importance in regard to questions of impotence, rape, etc. A well-placed addition in this last chapter is, a precise description of the methods of *quantitative* analysis of urea (after Liebig) and diabetic sugar (after Fehling). On the whole, there are very few books, of less than 400 pages, containing so much information of value to the student, as this.

H. H.

ART. XXXVII.—*Electricity in its Relations to Practical Medicine.* By Dr. M. MORITZ MEYER, Royal Counsellor of Health, etc. Translated from the third German edition, with Notes and Additions, by WILLIAM A. HAMMOND, M.D., Professor of Diseases of the Mind and Nervous System, etc., in Bellevue Hospital Medical College; Vice-President of the Academy of the Medical Sciences, National Institute of Letters, Arts, and Sciences, etc. etc. 8vo. pp. 497. New York: D. Appleton & Co., 1869.

DR. MEYER adverts with some feeling, in his preface, to the crude and absurd ideas entertained by many upon the subject of electro-therapeutics. Its quite frequent abuse, in the pretensions of irregulars, has naturally led to a fear of it in the minds of a considerable number of the more cautious men in the profession. Yet, in spite of these obstacles, it has made considerable advances, in its applications to practical medicine, surgery, and obstetrics. The present work was prepared in competition for a prize at Ghent, in 1852. Though not crowned with success, the prize being awarded to Duchenne, it was honourably mentioned, and published in the annals of the Medical Society of Ghent; after which the author issued it himself at Berlin in 1854. A second edition was called for in 1860, and a third in 1868. Dr. Hammond has made the translation evidently with somewhat less care than is manifested in his own original compositions. A few sentences and expressions lack perspicuity; as, the word "cadent," a word not in the dictionary, for caustic (p. ix.); the long opening sentence on p. xviii.; and the following (p. 60): "It increases the power of a muscle produced by the influence of an induction current." An inaccurate statement of Ohm's law, concerning the relation of the strength of a galvanic current to the electro-motor power and resistance, occurs twice (p. 19); the strength of the current being said to equal the electro-motor power *multiplied* (it should be divided) by the resistance. Another error from want of care is met with in the figures, on p. 24, giving results of the application of that law. These are, it is true, minor matters.

The history of the progress of the knowledge of galvanic electricity, from the time of the discoveries of Galvani, Volta, and Humboldt, till now, is fairly given by Dr. Meyer. In the following passage a good deal upon that topic is comprised.

"With Faraday's discovery of induction, electricity began a new era in its application to medicine. In 1832 Pixii constructed the first magneto-electric rotary machine, to which, later, Saxton, Keil, Ettinghausen, and Stöhrer made important improvements. As the high price of this apparatus prevented its general use, Aldini, Neef, Wagner, Rauch, and others constructed cheaper Volta-electric machines, which Duchenne, DuBois-Reymond, and Stöhrer considerably improved. Physicians, naturalists, and physiologists now devoted themselves with equal ardor to electricity. Marshall Hall, Golding Bird, Stokes, Philips, Graves, Donovan, among the English. Pousseuille, Pétréquin, Masson, Froriep, Schuh, Heidenrich, Richter, Moritz Meyer, Schulz, Erdwan, Baierlacher, Eckard, Remak, Heidenhayn, A. Fick, Ziemssen, Althaus, Rosenthal, Benedict, Trommhold, etc., among the Germans. Pravaz was the first to conceive the idea of curing aneurism by galvanopuncture, Liston the first to test the method on the human subject, and Civisilli the first who succeeded. Bertani and Milani made use of electricity in varices, while Radford, Simpson, Frank, and others used it in obstetrics.

"Encouraged by Davy's and Ritter's observations relative to the influence of large plate voltaic cells in producing heat, Crussell, Marshall, Middeldorpf, Alph. Amussat, Zsigmondy, Schuh, etc., made use of the platinum wire loop as a cauterizing apparatus for surgical purposes. After Nicholson and Carlisle, through the voltaic pile, had decomposed water, and Davy the alkalies, here and there was to be found a physician who made use of the chemical action of electricity for physiological purposes. Heidenrich, with the pile, decomposed the blood; Prévost, Dumas, and Bence Jones, calcareous deposits in the bladder; Crussell, Colley, Willebrand, and Wells used it in cases of malignant tumours and ulcers,—Fabrè-Palapat, Orioli, etc., endeavoured to introduce medicines

into a part of the human body; and, finally, Verqués, Poey, and Meding to remove metals from the organism.

"Besides the advances in therapeutics thus made through electricity, in the broad fields of medicine, surgery, and obstetrics, owing chiefly to the researches of Hall, Duchenne, Meyer, and Benedict, the new agent was made serviceable in other ways. Thus Duchenne, by perfecting the necessary apparatus, as well as by an improved (localized) application of the inductive current, succeeded in introducing electricity into medicine as an important diagnostic aid. During the last decade, Remak endeavoured to become more thoroughly acquainted with the physiological difference in the action of the constant and interrupted currents, to assign the diseases of the muscles and nerves almost exclusively to the former, and to extend its efficiency to the treatment of cerebral and spinal affections." (pp. 5, 6, 7.)

Dr. Meyer, in other parts of his volume, does justice to the labours, not above referred to, of Weber, Pflüger, Erb, and others. He omits, however, all reference to the curious researches of Kühne, with the aid of the microscope, upon the influence of the continuous electric current upon *protoplasm* and non-muscular organic cells; a definite movement being produced in the latter, sometimes with change of form, suggesting the phrase *cell-tetanus*.

Dr. Hammond's most important contribution to the volume consists in several pages upon the subject of *infantile paralysis* and its treatment by electricity. With this addition, we may regard the volume before us as presenting all that may be required for an acquaintance with the most positive results, the most useful appliances and most hopeful methods of research, in electro-therapeutics.

H. H.

ART. XXXVIII.—*The Law of Human Increase; or Population based on Physiology and Psychology*. By NATHAN ALLEN, A.M., M.D., Lowell, Mass. 8vo. pp. 158. New York, 1868.

In a former number of this Journal, we presented a brief account of Dr. Allen's very admirable "Treatise on the Intermarriage of Relatives." The work before us, by the same author, was received after the account above referred to was in print. The latter appears to us to be, in every point of view, equally worthy of notice with the first-named treatise, as well from the highly interesting and important character of the subject it discusses, as from the apparent correctness of the views advanced by its author in reference to it.

Dr. A. states that several years ago his attention was directed to the change taking place in the native population of Massachusetts and the other New England States. He ascertained that the birth-rate of the entire stock was continually decreasing, while among the immigrant portion of the same communities, there had been experienced little or no such change. By a census of the people of Massachusetts taken in the year 1765, it appears that, of the entire population, nearly 50 per cent. were under 16 years of age, while at the present time, not more than 25 per cent., if so many, are under that age. While at the former period the average number of offspring to each couple amounted to from eight to ten, at the present time it scarcely exceeds *three*. A somewhat similar condition of things is found to exist also in some of the other States, and in certain foreign countries; not amid the dwellers in our large cities only, but amid those also of rural villages, towns, and districts. In the foreign portion of our population—consisting mainly of immigrants from Ireland, Germany, Holland, England, and Scotland, the number of children to each family outnumbers nearly threefold what it is among the native stock. Now these facts cannot be explained entirely by pointing to the large emigration of the native stock, inasmuch as it will be found that the loss of population from this cause is pretty nearly made up by immigrants from other of the States; nor can they be explained entirely by the circumstance of a decrease in the marriage rate among the native stock, for such decrease has not taken place to any great extent. The custom of postponing marriages to a later period in

life than was customary formerly, may have concurred to a slight extent in lessening "human increase," but by no means to so great an extent as the feeling that has grown up of late years, in respect to offspring—viewing them when numerous as a misfortune, a burden, as well in a pecuniary point of view, as by their proper nutriment and care, requiring the confinement of the mother to the nursery for the greater part of her time; interfering thus with the calls of a life of fashion, or the pursuit of worldly pleasure. These prudential considerations, as they are falsely termed, have exercised so baneful an influence over the minds and natural instincts of parents, as to induce a resort to various artificial and criminal means for preventing conception, or, when it has already taken place, to destroy the embryo, and thus prevent maternity.

Giving to the above causes their due amount of influence, they alone, however, are not sufficient to account for the diminution of productiveness in our native stock in certain portions of the country. Dr. Allen attributes this diminution to some deep, vital deterioration in the organism, especially of the female portion of our people. A deterioration that incapacitates our women from the fulfilment of the chief end of the marriage of the sexes, namely, the propagation of the species, or, when conception does take place, rendering defective the capacity to confer upon the offspring a perfect organization and an amount of vital power to enable it to survive in vigour its birth for any length of time. The deterioration referred to is ascribed by Dr. A., and, we believe, with great propriety, to the almost radical change which has taken place in the education, the domestic habits, the daily occupations, the dress, the amusements, of the female sex especially, and in the requirements, occupations, and the manner of living of the community at large.

The human body in its healthy, physiological condition may be compared to a perfect machine composed of a number of parts, each performing regularly and faithfully its own allotted work, without interfering with that of others, but rather aiding the regular performance of the functions of all of the other parts. This harmony in the action and reciprocal influence of the several portions of the human organism constitutes the basis for the largest amount of health, of longevity, of general strength and of procreative power of the human being. It also furnishes the only real standard of beauty for the human form.

The healthful condition of the human organism, so far at least as regards the vital condition and harmonious action of its several organs, has, during the last half century, been gradually, but continually undergoing a deterioration; certain organs, or sets of organs, being stimulated into an excess of susceptibility and activity, whilst others again remain more or less deficient in these respects—the consequence being that the harmonious action of the several portions of the living system is interfered with, and many of the functions essential to secure the proper ratio of increase in the human family, in particular localities, or among an entire people, is to a greater or less extent impaired. The causes of this important change have their origin partly within the body, and partly it is the result of the action of external agencies.

The entire subject is very clearly set forth and very ably reasoned out by Dr. A. His arguments and their illustration being derived from facts and observations, of the entire accuracy and applicability of which there can, we think, be scarcely a doubt.

D. F. C.

ART. XXXIX.—*Diseases and Injuries of the Eye; their Medical and Surgical Treatment.* By GEORGE LAWSON, F. R. C. S., Surgeon to Royal London Ophthalmic Hospital, Moorfields, and Assistant Surgeon to the Middlesex Hospital. 8vo. pp. 436. Philadelphia: Lindsay & Blakiston, 1869.

MR. LAWSON'S manual is the third valuable contribution to ophthalmic literature that has recently emanated from the Royal London Ophthalmic Hospital. This series places us under obligations to the staff of that institution for the industry and thoroughness with which they seek to share with the profession the invaluable practical information they are themselves able to acquire.

Mr. Soelberg Wells and Mr. Charles Bader, colleagues of Mr. Lawson, have

recently written complete text-books, with details in profusion, for ophthalmic surgeons, whilst Mr. Lawson has striven with eminent success to afford a concise manual of all the diseases and injuries of the eye for the use of students and general practitioners, in which he has embodied his own lengthened and extensive experience, the special points of practice of his colleagues, and the latest results obtained by the continental ophthalmic surgeons.

In regard to the diseases and injuries of the eye with their therapeutics, operations, and results, Mr. Lawson has given us a most concise and reliable treatise; but we regret to have to say his chapter on Anomalies of Refraction and Diseases of Accommodation, consisting of twenty short pages, would afford the student but little assistance in the practical and successful correction of the optical defects of the eye.

W. T.

ART. XL.—*An Essay on the History of Aneurisms of the Arch of the Aorta; a Thesis for the Degree of Doctor of Medicine, presented to the Medical Faculty of the University of Louisiana.* By EDMOND SOUCHON, Laureate and Interne of the Hospitals of Paris, late Curator of the Museum of the Hospitals. 8vo. pp. 72. New Orleans: L. Graham, 1867.

THE title of this little work is as modest as is the aim of the author as enunciated in his opening paragraph: "Our sole claim, our sole merit, if merit at all there is, is the arrangement, the classification, the *method*, in a word, which we have followed in writing down the many facts gathered;" and we think that he may be allowed to have fully established his claim. In these days of industrious research, the mere accumulation of medical facts is becoming so vast in its proportions that it is a question whether, in a short time, the best-trained memory will be able to retain them. Thus far, medical literature has, in general, rather been occupied with the acquisition of matter than with its arrangement: it is time, now, that the material at our disposal, but practically almost inaccessible, should be submitted to rules of logical, systematic digestion, such as obtain with other sciences.

Such seems to be Dr. Souchon's object in the preparation of this essay; and he illustrates this idea very clearly in the typical case which he has chosen. His extensive compilation of researches on the subject of aneurisms of the aortic arch—for he lays claim to little originality—is arranged with a symmetrical order of succession, and a regard to the rational interdependence of the lesions and phenomena noted, extremely seducing when the eye has once conquered its repugnance to a mode of exposition that may, at first sight, seem too minutely precise.

He introduces, at the outset, two tables, of the systematic and topographical relations of the arch of the aorta, with the new or acquired relations of the tumour, that are models of anatomical arrangement, and would of themselves form excellent guides to the study of the affection. The pathological anatomy is treated exhaustively, and yet compactly, and proves the advantages of description based upon a systematic analysis of the various features of the subject. The pathological *physiology* of the disease is given a prominent place, and the transition to symptoms thus made easy and natural; as well as avoiding, in the latter, all theoretical or other considerations not falling strictly within the province of clinical detail.

The diagnosis dovetails closely with the two preceding articles, and presents a thorough analysis of a complicated mental process, which numbers of practitioners accomplish rapidly, yet without in the least imagining what infinite trouble they would have to explain the mechanism by which they arrive at the result.

It would be difficult, as well as unjust, by extracts from any given portion, to present an idea of the execution of a work, in which each part depends on or leads to another. We regard this essay as undoubtedly the most complete chapter that we have yet had on the history of thoracic aneurisms.

W. B. D.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Unclosed Urachus, with Umbilical Fistula.*—Mr. THOMAS ANNANDALE describes (*Edinburgh Medical Journal*, Feb. 1870) a case of this in a man, æt. 39, who since his birth had suffered from an umbilical fistula, through which part of his urine flows. The patient was a big, strong, healthy man, having all parts of his body perfectly developed. When making water in the upright position about two-thirds come out in a full stream through the umbilical fistula, the other third passes out in the natural way by the urethra in a strong but small stream.

When the patient lies down the urine flows out involuntarily through the fistulous opening, more markedly so when he lies on his left side; much less flows when he lies on his right side.

No water passes involuntarily as long as he maintains the upright position.

He requires to pass water regularly about every two hours, and in doing this it is necessary for him to unloose all his clothes in front and bend forwards. His health is good; but he has on one or two occasions passed fine calculous matter with his urine, and, in telling me of this, he remarked, "It is a wise Providence who has afforded me this second channel for getting rid of my water, and any stones which may form."

A careful examination of the patient showed that the genital organs were normal and well developed, and that the walls of the abdomen and pelvis were perfect.

The umbilicus appeared a little flatter than usual, and presented in its centre an opening with depressed margins. The opening was large enough to admit the tip of the little finger, and a No. 12 catheter was easily introduced into it, and passed down into the bladder. The inner surface of the opening and its margins were smooth and healthy, and there was no trace of irritation or excoriation in the surrounding skin. A No. 6 catheter was readily passed along the urethra into the bladder, with the result of determining a perfectly normal but slightly contracted condition of the urethral canal. It was suggested to the patient that the fistula might be closed by an operation; but he would not submit to any interference, and returned home, being quite satisfied to know that there was no danger in his condition.

2. *Red Blood Corpuscles of Oviparous Vertebrata.*—Mr. W. S. SAVORY, in a paper read before the Royal Society, states that of all vertebrata, the red corpuscle is, in its natural state, structureless. When living, no distinction of parts can be recognized; and the existence of a nucleus in the red corpuscles

of ovipara is due to changes after death, or removal from the vessels. As the oviparous red cell is commonly seen, the existence of a "nucleus" is too striking an object to escape any eye, but that it is so is due to the circumstances under which the corpuscle is seen, and the mode in which it is prepared for examination. It is possible to place blood-cells under the microscope for examination so quickly, and with such slight disturbances, that they may be satisfactorily examined before the nuclei have begun to form. They may then be shown to be absolutely structureless throughout; and, moreover, as the examination is continued, the gradual formation of the nuclei can be traced. The "nucleus" first appears as an indistinct shadowy substance, usually but not always, about the centre of the cell. The outline of it can hardly, for some seconds, be defined; but it gradually grows more distinct. Sometimes it never forms so as to be clearly traced in outline, but remains as an irregular shapeless mass, in its greater portion very obscure. Sometimes only a small part, if any, of an edge can be recognized, most of it appearing to blend indefinitely with the rest of the cell substance. Sometimes it happens that in many corpuscles the formation of a nucleus does not proceed even so far as this. No distinct separation of substance can anywhere be seen, but shadows, more or less deep, here and there indicate that there is greater aggregation of matter at some parts than at others. Occasionally some of the cells present throughout a granular aspect. When the nucleus is well defined, the cell wall is strongly marked; when one is confused the other is usually fainter. This, however, does not apply to colour; on the contrary, when the nucleus is least coloured it contrasts most strongly with the surrounding cell. As a rule, the wall of the cell is more strongly marked than the nucleus.

To the objection that the nuclei are present all the while, but are at first concealed by the surrounding substance, the author replies that, when one cell overlaps another, the lower one is seen through the upper clearly enough to show that the substance of these cells is sufficiently transparent to allow of a nucleus being discerned if it exists. When a nucleus is fully formed it hides that portion of the outline of a cell which lies beneath it.—*Brit. and For. Med.-Chir. Rev.*, Jan. 1870, from *Ann. and Mag. Nat. Hist.*, July, 1869.

3. *Physiology of the Pancreatic Secretion.*—BERNSTEIN examined the secretion of the pancreas as it was discharged from persistent fistulæ of the duct. The fluid possessed all the digestive attributes of the pancreas, and M. Bernstein holds that the opinion of Bernard that only the tenacious secretion flowing from fresh fistulæ presents the properties of the healthy juice is erroneous. Instead of a canula, only the ends of a looped lead wire were introduced into the duct. It has long been known that the secretion is induced by or increased during the act of digestion. M. Bernstein found that during fasting no secretion occurred, but that the flow was abundant during the first hour after ingestion of food, attained its maximum in the course of the second or third hour, then underwent an increase, rose to some extent during the fifth, sixth, and seventh hours, and gradually fell to the fifteenth hour, when it altogether ceased. The two periods of increase are obviously the result of reflectorial nerve excitation coinciding with the entrance of food into the stomach and intestine. Smaller variations of irregular amount were observed, and, as was noticed by Weinmann and Bernard, complete suppression occurred during vomiting. This effect is not due to any mechanical influence, since it begins with the mere disposition to vomit. Irritation of the central extremity of the divided pneumogastric suppressed the secretion for a long time. Irritation of the peripheric extremity was without effect, as was also simple division of the vagus. The secretion of the pancreas thus appears to be subject to two opposite nervous influences, both of which proceed from the stomach. In subsequent experiments, the nerves distributed to the pancreas accompanying the arteries were all divided, the effect produced was a persistent continuous flow of healthy juice, the gland was rosy and sometimes cedematous. Poisoning with woorara caused a great increase in the quantity of the secretion. The dry residue of the juice obtained varied from 1.68 to 5.39 per cent., the amount varying with the rapidity of the discharge.—*Brit. and For. Med.-Chir. Rev.*, Jan. 1870, from *Centralblatt*, Oct. 9th, 1869.

4. *Defect of Epiglottis*.—In place of the epiglottis as normally fashioned, there was found by Dr. EBERTH, in a female 56 years old, merely a fold of the mucous membrane, 5 mms. high and 1 mm. thick, with a crescentiform body of a fibro-cartilaginous consistence 3.5 mms. high. From the point of insertion of this fold of the mucous membrane of the pharynx spread two other wider folds, which turning backwards, under the pointed angle, united, and with the epiglottidean fold closed the three cornered glottidean cleft. There was no reason to infer that in this case the defect of epiglottis was a secondary abnormality, it was evidently congenital. There were only slight functional disturbances. The case is one seldom met with. Dr. E. cites as the only recorded case beside his own, that of Targiom Tozetti; even in this case, however, J. F. Meckel believes the defective epiglottis to have been the result of disease occurring after birth.—*Virchow's Arch.* xliii., per *Centralblatt f. d. Med. Wissenschaften*, April 13, 1869. D. F. C.

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

5. *Hydrate of Chloral*.—In our preceding No., p. 231, we presented a full report of what was up to that time known respecting the medicinal properties of chloral. Numerous clinical experiments have since been made with the view of determining its therapeutic value, and we shall now endeavour to give a digest of the most important of these.

One of the most instructive and apparently carefully drawn up reports of the therapeutic action of chloral which we have met with is that by Dr. JAMES B. RUSSELL, Physician to the city of Glasgow Fever Hospital, entitled "*Clinical Observations on Hydrate of Chloral as an Hypnotic in Typhus*." (*Glasgow Medical Journal*, Feb. 1870.)

Dr. R. gives a table of twenty-one cases in which he employed chloral. This table we do not deem it necessary to insert, but shall content ourselves with presenting the deductions which he draws from his experience in these cases.

Dr. R. was at first led to exhibit the medicine in the dose of 40 grains, which proved to be an over-dose, producing a manifest toxic effect upon the heart. In one case even so small a dose as 20 grains produced cardiac irregularity, and lowered frequency of the heart's action was not uncommon. The large dose was given also twice to a bulky, robust man, but did not affect the heart, so far at least as to cause irregularity. The pulse seemed, but with exceptions, at first and that speedily, to improve in quality, but in an hour it became soft and small, sometimes lowered in frequency, and finally the action of the heart became irregular. Although it is difficult to eliminate from the sedative effects of mere repose on the respiratory and circulatory organs of a delirious person, those which are due to the drug which induces the repose, there can be little question that the chloral acted directly and specially on the heart in these instances. In many of the cases also, from the aspect of the countenance, flushed and full, and from the improved colour of the rash, brightening when petechial—the impression of stimulated action receives further confirmation. The breathing also is quickened and short, but not laboured. These phenomena are, however, of the most transient description, and soon give place to those with which we are familiar in natural sleep. The state of the pupil is the same—contracted to the utmost, as in the "pin-hole pupil" of Graves; but, differing from the contracted pupil of narcosis, it expands in the chloral sleep immediately the patient is awakened. The power of voluntary motion seemed never to be in abeyance, but always at command as in natural sleep; and no change in the susceptibility of sensation was present. The sedative effect on the brain and nervous system was sometimes visible in a few minutes, but seldom became developed into true sleep and unconsciousness until from ten to twenty minutes. The transition from waking to sleeping was noted to be often very sudden. If disturbed by any external or internal irritation, as by counting the pulse, for

instance, the patient often looked up, with natural or dilated pupil, then turned on one side, seemed to sleep *at once*, and on lifting the eyelid, no movement was caused, and the pupil was found to be almost abolished. Dr. R. never observed dilatation of the pupil from the doses he employed.

The chloral, according to Dr. R., acted as a sedative and hypnotic with remarkable uniformity and rapidity, in almost every form of cerebral excitement incident to febrile disease.

Sir J. Y. Simpson also bears testimony to the value of chloral as an hypnotic and sedative (*Med. Times and Gaz.*, Jan. 1, 1870). As a general rule he has found it as sure a producer of sleep and soother of pain as opium—swifter in its induction of narcotism and more prolonged in its effects—while it is free from any of the unpleasant after-effects of the latter.

Dr. Francis Goolden states (*Practitioner*, March 1, 1870) that in a paralyzed gentleman of middle age, who from the extreme contraction of his lower limbs, and from other causes, suffered great pain, and was hardly able to get any sleep, he tried it in a half-drachm dose; the result of this first experiment being that the patient had a tranquil sleep of twelve hours' duration—and this after various other narcotics had failed to give any relief. But it was disappointing to find that on subsequent occasions, although the chloral was given in large doses, sleep was not obtained, but the patient was merely thrown into restless semidelirium. It may be, that beyond a certain dose, chloral loses its proper *hypnotic* effects; and, indeed, we are rather inclined to think that this will prove to be the fact.

Dr. Russell contrasts the *comparative effects of chloral with other hypnotics*, and first with that of opium. The chloral sleep, he says, is different from opium sleep, and both positive and negative properties in the former drug, mark it as safer than the latter. "1. The action of the pupil to which I have already alluded illustrates excellently the close approximation to a natural sleep which chloral bestows, and the difference between it and opium in physiological effect. In all forms of sleep the pupil is contracted to the utmost. But, in natural sleep, the moment the sleeper is roused, and the eyes are opened, the pupil expands; while in an opium sleep the pupil remains contracted, it may be only for a few seconds, or for minutes, or hours. This illustrates in little the general condition of the nervous and muscular system in natural and chloral sleep, and in opium and other narcotic forms of sleep. As we have seen, the chloral sleeper may be roused at any time. He is at once in the full command of his functions, he may take food, pass urine, cough with full strength, expectorate, &c.; and whenever the temporary excitation ceases, he may drop over again into unconsciousness. Indeed, as a rule, the chloral sleep consists of a continuous initiatory stage, followed by a period which may extend over six, eight, or more hours of sleep, interrupted by intervals in which food, &c., may be given without the necessity of waking the patient, or any risk of re-establishing the excitement. This was specially noted in some of our cases, as in Case VII., '8 P. M., sleeping; had drinks at intervals, falling asleep at once afterwards.' Not so with the patient after an opiate which will produce an equally sedative effect. His pupils are small; if his lungs are gorged with mucus, he has neither the intelligence to see the necessity, nor the muscular energy at command to cough and expectorate. 2. The excretions are not affected by chloral. They are by opium. The bowels are made costive, the urine scanty, the mouth parched, and the skin dry. 3. The administration of an opiate to a child is in any circumstances a procedure which the practitioner adopts with misgivings. Chloral may be given with perfect safety and with perfect success. 4. Opiates, even as combined by Graves, with tartar emetic, are uncertain, very frequently quite futile. As already stated, I have met with no patient who resisted the action of chloral."

Second, as regards cold sponging, he says the latter "soothes by the abstraction of heat from the periphery, and is consequently useful only in the acute delirium and insomnia of the acme of fever, when the skin is pungently hot, and the condition such as I usually describe by the adjective 'fiery.' In these circumstances, sponging with iced water every two or four hours, has often a calmative effect."

With regard to the *dose and mode of administration*, Dr. R. says in his "cases all the benefits without the dangers of chloral were obtained with 20 grain doses for adults; 2 grains for an infant of 18 months; 3 grains for one of 3 years; 10 grains for children of 9 and 14 years. The drug was given in an ounce of water sweetened with half an ounce of syrup.¹ Children take the draught quite readily in this way, and like it. If not sufficiently diluted, the medicine is vomited. When sufficiently diluted it may be borne by the most irritable stomach. The dangers of an over-dose of chloral are manifest from the cases in which 40 grains were administered. The depressing action of chloral on the cardiac ganglia is then developed. For the sake of the purity of the experiment, in some of my cases, all stimulants, and to some extent even food, were prohibited. This is, however, unnecessary, especially in view of the readiness with which the chloral, like the natural sleep, may be broken and resumed. Indeed, the same rule applies here as to all the circumstances of a fever patient—not to interrupt the regular administration of food for any cause, and remembering that we are dealing with a drug which has a special action on the heart, we should first be cautious in adapting the dose to the age and vigour of the patient; and then, having given it, should watch the pulse at intervals, more particularly during the next six hours."

We shall now notice the results of experiments with chloral in particular diseases.

Typhus Fever.—According to the experience of Dr. Russell, chloral "seems to have a more immediate and permanent curative action in the acute delirium of the acme of typhus than in the *delirium tremens* of the second and third weeks, when the blood is loaded with the products of the fever and there are general tremors and subsultus. Its permanent curative action was frequent and more common in the active than in the adynamic form of delirium. Although this adynamic delirium, or the *delirium tremens* of typhus, as I call it, was less promptly amenable to chloral, as it is to all sedatives, Cases VI., XIII., and XVIII. show excellent results. Indeed, there is no other sedative but chloral which I should have ventured to administer, still less to repeat, in the last two. Seeing that the delirium depends in such cases on the presence of impurities in the blood, the elimination of which is a process requiring time, all that we can expect from a sedative which does not act by hastening elimination, is to soothe from time to time, and to check vital exhaustion until the process is completed by the natural channels. In this aspect, the chloral appears in no case to better advantage." Of the twenty-one cases given in Dr. R.'s table, he says *not one proved insensible to the chloral when repeated*. He never met with an equal number of consecutive cases of delirium, &c., in which any other sedative showed such uniformity of action, or even approximated to it.

The mode of action of chloral, Dr. R. considers, explains how it is that chloral is so beneficial in typhus. "According to Liebreich," he says, "the ultimate physiological action is not that of chloral, but of chloroform produced by the decomposition of chloral by the alkalies of the blood. This theory is strongly supported by the fact that chloral mixed with fresh blood does evolve chloroform. M. Personne and Dr. Richardson agree with Liebreich. Indeed M. Personne has gone further in the proof of the theory by demonstrating the presence of *chloroform in the blood of dogs*, to whom *chloral alone* had been administered."² Now it is well known that the tendency of the typhus process, as it advances, is to *increase the alkalinity* of the fluids of the body. Ammonia can be detected in all the excretions in an amount much greater than in health. The urine, at the close of a severe case, gives off free ammonia so copiously as to cause lachrymation, and to be sometimes quite unbearable by one auscultating the back, for example, of a patient passing it involuntarily. "There is good reason for believing," says Murchison, "that the unnatural fluid state [of the blood] in typhus results from an abnormal amount of ammo-

¹ This dilution is enough for the lessened sensibility of a fever patient, but from personal trial, *not for ordinary use*.

² Gaz. Heb., November 19th, 1869.

nia." Whatever may be the precise pathological product, there is no doubt of the fact that typhus blood is more highly alkaline than the blood in health. Hence, if its action depends upon alkalinity at all, and M. Personne seems to have demonstrated that fact, then chloral must be, *par excellence*, the hypnotic suited for typhus. Liebreich's theory is in itself beautiful and attractive, and in the words of a recent reviewer, "it is impossible not to feel a genuine admiration for the stroke of genius which is indicated in the prediction, from purely chemical considerations, that chloral would yield up chloroform to the blood in precisely the form in which it might be expected to do the maximum of good and the minimum of mischief." The illustration of the theory furnished by the rapid and magical effects of chloral in typhus involves an idea even more attractive. We transform a pathological into a therapeutic process. The fever-products liberate the soothing agent, and so calm the excitement which they themselves have made.

"The subject of special susceptibility in typhus patients to the influence of chloral, in reference to the theory of its action, is one which must be reserved for future investigation. But it is entirely confirmatory of my supposition to find that there is such a susceptibility. The chemical conditions on which, according to Liebreich, the physiological action of chloral depends, exist in typhus in excess. The physiological effects of chloral ought, therefore, to be developed in a typhus patient with smaller doses and with greater rapidity. My experiments are few, but they are all *positive in their result*. Liebreich states that *the nervous power of the heart is the last which suffers*. Richardson says: "In fatal cases the functions destroyed are, 1. The cerebral. 2. The voluntary muscular. 3. The respiratory. 4. *The heart*." In my observation on *physiological action*, it will be seen that a dose so small as 40 grains in two out of three cases, proved toxic to the extent of developing the ultimate of the series of functional effects—that upon the heart; and that in one case even 20 grains seemed to produce this result, while the whole series of cases illustrates the striking facility with which small doses produce the primary effect on the brain and voluntary muscles, and sometimes lowers the frequency of the pulsations." This toxic action of chloral on the heart has been noticed by other observers, as we shall presently show.

Cerebral Disturbances.—We have seen the beneficial effects of chloral in the delirium of typhus fever, and it is equally useful in several other forms of cerebral disturbance.

Considerable evidence might be adduced to show its remedial powers in *delirium tremens*. Dr. J. H. Barnes records (*Lancet*, Nov. 27, 1869) ten cases of that disease treated by chloral, and in most of them a peaceful sleep was rapidly induced. In a case of the same disease, Dr. Cerenville found a gramme of chloral repeated for two successive days to produce sleep and calmness. (*L'Union Médicale*, Feb. 12, 1870, from *Soc. Médicale de Suisse Romande*, January, 1870.)

Still stronger proofs have been adduced of the beneficial effects of chloral in *acute mania*. Mr. A. M. Adams reports (*Lancet*, Jan. 22, 1870) very favourably of the influence of chloral in a case of acute mania following parturition, in which he had given bromide of potassium, Battley's sedative solution, and chloroform by inhalation without relief. He then administered 40 grains of the hydrate of chloral, and in about five minutes the patient became calm and sensible, and within ten minutes fell into a profound sleep, which lasted for seven hours. "During the progress of this case," says Mr. A., "in consequence of a periodic recurrence of the most severe form of mania which it has ever been my misfortune to witness, I have been obliged to give the chloral on about twelve separate occasions, in doses varying from forty to sixty grains, and always with the same result—namely, complete cessation, within a few minutes, of all cries and struggles, a return of calm consciousness, followed by a natural sleep, lasting from between six to eight hours. The pulse also, in a very marked degree, always improved when under its influence."

Dr. De la Harpe was equally successful in two maniacal females, whom baths and opium had failed to tranquilize. Thirty grains of chloral in water almost

immediately caused sleep. (*L'Union Médicale*, Feb. 12, 1870, from *Soc. Méd. de la Suisse Romande*, Jan. 1870.)

Dr. S. Teller relates (*Medical Record*, Feb. 15, 1870) a case of puerperal mania, in which morphia internally and by hypodermic injection was used without the least effect, and bromide of potassium caused excitement. Hydrate of chloral was then given, in the dose of fifteen grains, followed in four hours by a second of seven grains. After the first dose, the patient slept three and a half hours, and after the second four hours, without interruption. She afterwards again fell asleep, so that she slept seventeen hours out of twenty-four. The chloral was continued for six days, during which time she took one ounce altogether. No disagreeable symptoms appeared at any time, and the patient on the eleventh day was fully sensible and rational.

Dr. George Crawford relates (*Med. Times and Gazette*, Jan. 22, 1870) a case of acute mania in a female who had not slept during five consecutive minutes for five weeks, and who had taken opium and morphia without benefit. Dr. C. then prescribed twenty-five grains of chloral for three nights in succession, and its effects were quite marvellous. Tranquil sleep was produced, and the patient soon became quite well.

Puerperal Convulsions.—Mr. Hay has communicated to the *Practitioner*, (March, 1870,) a case of this successfully treated by hydrate of chloral, after failure of belladonna and bromide. The subject of it was a primipara, delivered Feb. 9th, at 7.30 A. M. "At 12.30 P. M. she was suddenly seized with convulsions, and continued having three or four attacks every hour, each increasing in severity, till 7 P. M., when I gave her sixty grains of hydrate of chloral: she had an attack soon after. She then slept quietly till 1 A. M., when she had another attack, but much milder; I gave her thirty grains more of the hydrate. After that she had no more convulsions, but continued to sleep till about 3 P. M., except at short intervals, when she was roused to take nourishment. When she awoke, she complained of great headache, which continued till next morning; she then complained of everything appearing unnaturally large. She has had no bad symptoms since."

Chorea.—A number of cases have been reported showing the remedial influence of chloral in chorea. Dr. Russell relates (*Med. Times and Gazette*, Jan. 6, 1870) a severe case of the affection in an apparently healthy woman during the early months of pregnancy, in which bromide of potassium was given without benefit. Chloral was then administered with the best results. Sir J. Y. Simpson has used chloral in continuous small doses in chorea with most marked benefit (*Med. Times and Gazette*, Jan. 8, 1870), and M. Bouchut has likewise in severe cases found it beneficial.

M. Bricheteau (*Bull.-Gén. de Thérap.*, Nov. 30, 1869) says that he has given from thirty to forty-five grains of chloral to several children affected with severe chorea. "Three of them slept the first day, and during the sleep of three or four hours the movements were entirely suspended. The fourth did not sleep the first day, but the next day the medicine produced its hypnotic effects and the movements were suppressed. But what was my surprise when they awoke to find that the movements were diminished. After the second dose, the next day, the motions were still more diminished, and with two children at the fourth day of this medication the movements had almost entirely ceased. Nothing more remained than imperceptible motions. One of these children that bit its tongue each moment, ceased to do so, and from impossibility of standing or walking it came to do so with ease, and no trace of chorea remained, except very slight movements. One of these children, cured, has gone out of the hospital.

"With the two others the treatment commenced five days later, is not yet terminated, but the same immediate amelioration has been observed, and it is without doubt that in chorea hydrate of chloral causes the muscles to become powerless, and very promptly reduces the motions to an almost normal condition."

Pulmonary Catarrh.—Hager states that he has hitherto considered morphia as the best remedy for catarrh; but recently he has employed in its place the hydrate of chloral, in doses of three grammes every half hour, and during the whole period it was administered, he observed a diminution of the inflammation

of the mucous membrane and the cessation of the irritation which accompanied the cough. We may then, he says, at least in this affection, advantageously replace the morphia by chloral. (*Le Mouvement Médical*, Feb. 27, 1870, from *Pharmazeutische Centralhalle*, 1869.)

Whooping Cough.—Dr. A. Ferraud details (*Bull.-Gén. de Thérap.*, Nov. 2, 1870) three cases of this disease in children, in which other remedies had proved ineffectual, and which were successfully treated by chloral. He gave the remedy in doses of twenty-six centigrammes in syrup. One dose before dinner, another after dinner, and a third at bedtime. A sound and refreshing sleep replaced fits of coughing and vomiting, and after ten days' perseverance in the remedy in one case, fifteen in a second, and twenty in the third, convalescence was established.

Mr. A. N. Adams (*Lancet*, Feb. 5, 1870) likewise gave it in a severe case of whooping-cough, in a child six years old, in doses of five grains three times a day, or six grains at bedtime, and found it to be a most valuable remedy.

Asthma.—Mr. A. M. Adams, of Lanark, states (*Lancet*, Jan. 22, 1870) that he was called to a man "labouring under unusually severe asthmatic paroxysms. He had been a patient some time ago in the Brompton Hospital; and, in consequence of the severity of his seizures, had occasionally to be put under the influence of chloroform. This, however, only gave him, he tells me, very temporary relief. His agony being excessive, I administered thirty grains of the hydrate of chloral. In a few minutes his breathing became quite easy; and within twenty minutes he fell into a calm sleep, which lasted for eight hours."

Neuralgia.—The efficacy of chloral for the relief of neuralgic pains seems to be sufficiently well established. In addition to the evidence adduced in our preceding number, we may state that M. Hardy reports (*Mouvement Médical*, Feb. 6, 1870) a case of severe facial neuralgia, which, after having been rebellious to sulphate of morphia and injections of chloro-hydrate of morphia, was successfully treated with chloral. We have ourselves prescribed it in several cases of neuralgia with entirely satisfactory results.

Hydrophobia.—M. Rémond gave chloral in a case of hydrophobia in l'Hôpital la Pitié, but without retarding the fatal result.

As an Anæsthetic, the hydrate of chloral was employed in the Munich Hospital in the service of Prof. Nussbaum. In twenty cases, it caused anæsthesia in only a single one—a woman of weak constitution; all the other subjects experimented on experienced only drunkenness, and they said the pain caused by surgical operations was less severe than under chloroformization, and sometimes even was scarcely felt. One only of the twenty patients experienced no pain at all. (*Mouvement Médical*, Feb. 27, 1870, from *Moniteur Scientifique*, 1870, p. 139.)

Toxic Effects.—It must not be concealed that the hydrate of chloral sometimes occasions unpleasant symptoms. When it was first introduced as a therapeutic agent, it was given, it appears to us, in unnecessarily large doses. Practitioners were probably led to this under the idea that it must be given in sufficient dose to produce anæsthesia; but experience has proved that for its hypnotic effect smaller doses suffice; and in some cases, where there is an abnormal condition of the heart, it should be given with caution even in small doses. We have already noticed the unpleasant effects observed by Dr. Russell in two cases, in which a dose of forty grains produced toxic effects on the heart, and another in a dose of twenty grains produced a like effect; and a case is related by Dr. Da Costa in his valuable paper in the original department of this number (p. 364), in which the latter dose produced the same unpleasant effect. The sphygmogram, in the last case gave a sinuous trace, and M. Bricheteau states (*Bull.-Gén. de Thérap.*, Nov. 3, 1869) that in chloral sleep, "if we study the sphygmogram we find the line of elevation feeble, the descent slight, forming a line almost uniformly sinuous."

Dr. J. R. Reynolds states (*Practitioner*, March, 1870) that he was called to a middle-aged lady who had taken chloral for the relief of neuralgia. "On the third day before my seeing her she had taken gr. 10 and gr. 15, and had found much relief. On the day before she had taken a larger dose with good effect.

"On the day of my being summoned the dose had been increased to gr. 45 or

gr. 50, and there had followed complete relief of pain; but in the course of an hour some 'faintness' was felt, and when I saw the patient this had increased to an alarming degree. Two hours had passed since the last dose was taken, and I found the patient with cold extremities; an excessively rapid, weak, irregular, and intermittent pulse; jactitation of limbs; an intolerable sense of sinking, and oppression at the pit of the stomach; gasping breathing, and confusion of thought.

"I observed at this time, and for three-quarters of an hour subsequently, that the radial, temporal, and tibial pulses were all of the character I now describe—frequent, weak, irregular in both force and rhythm, and frequently intermittent—but that the heart was acting regularly, although with increased frequency and diminished force.

"Stimulants, with white of egg, were administered freely, warmth was applied to the extremities, sinapisms were put on the cardiac region, fresh air was introduced plentifully into the room, and at the end of an hour from my first seeing the patient the pulse had become much steadier, though still very frequent and very weak. The syncopal feeling had diminished, the feet were warm, and there was a tendency to sleep.

"The state of comparative freedom from urgently dangerous symptoms lasted for longer than an hour, when—without any apparent cause—they returned with increased severity. The patient now seemed in the gravest danger. The superficial pulses were almost imperceptible, and when they could be detected presented the character I have described. Still the heart was regular in its beat, although feeble, and intensely rapid in its pulsations. The mind wandered much; there was utter prostration of muscular strength, the limbs being extended, the head low, and the aspect was at times that of impending dissolution. There was great dyspnoea, a sense of suffocating oppression at the base of the chest (in front), and urgent thirst.

"The treatment previously adopted was again pushed vigorously, and at the end of an hour and a half relief was obtained, and sleep followed. The next morning I found the pulse quite regular, and of its normal frequency."

It appears further from the sphygmographic observations of M. Bouchut, and of Drs. Anstie and Burdon-Sanderson (*Practitioner*, March, 1870) that chloral contracts the arterioles, and that in poisonous doses it carries this action to the extent of strong spasmodic contraction. It would appear highly probable that its hypnotic action is produced entirely through its causing a certain degree of arterial anæmia of the brain; but if this be the case, it can hardly be desirable to push it in very large doses. M. Bouchut himself considers chloral contra-indicated in cases of organic cerebral and cardiac mischief; and we are so far inclined to agree with him, that we should have much fear of the possible results of very large doses in cases of fatty or otherwise weak heart. We can hardly doubt that the mischief in Dr. Reynolds's case arose from the effect on a rather weak heart of a too pronounced enfeeblement of brain function from arterial anæmia.

These observations conclusively show the importance of giving the hydrate of chloral in small doses at first, so as to study its effects in each case, and of especial caution being observed in giving it to a patient with a feeble heart. The particular conditions of the system which contra-indicate its use have not yet been accurately defined, and until they are it should not be indiscriminately and recklessly administered.

We must not conclude this summary without recommending to our readers a study of the interesting paper by Dr. Da Costa in our present number.

6. *Summary of one hundred Cases in which Bichloride of Methylene was used as an Anæsthetic.* By PHILIP MIALI, Surgeon to the Bradford Infirmary.—Mr. M. commonly uses the cylinder introduced by Mr. Peter Marshall. Most of the administrations were for operations on the eye; but it was used also for amputation of the thigh and leg, and removal of the breast.

Insensibility in adults was generally produced in from two to five minutes; the average being 3 minutes 20 seconds; the minimum, $1\frac{1}{4}$ minute; the maximum, 5 minutes.

One dose of a drachm was generally sufficient to produce anæsthesia. In females, less than this will suffice. More than a drachm and a half was never found necessary to produce the first insensibility. The maximum quantity required before the completion of an operation was three drachms and a half.

The author proceeds to compare these results with those from the administration of chloroform. The average time taken to produce full anæsthesia was: in

Men—3 minutes 20 seconds with bichloride of methylene.

6 minutes 20 seconds with chloroform.

Women—2 minutes 22 seconds with bichloride of methylene.

4 minutes 18 seconds with chloroform.

Children—1 minute 16 seconds with bichloride of methylene.

2 minutes 24 seconds with chloroform.

The quantity of chloroform required was about double that of the bichloride of methylene. The duration of insensibility after removal of the inhaler was not found to vary with sex and age, as the time of the invasion was. It was not uncommon to find the patient completely conscious and walking away in less than three minutes after the commencement of inhalation.

Vomiting occurred forty-two times out of ninety-seven; nausea merely, six times. Vomiting did not occur once before anæsthesia was complete. The author thinks that the use of the bichloride is not likely to be much more free from consequent vomiting than chloroform.

The pulse was unaltered in 4 cases, quickened in 9, and lessened in frequency in 23.

The respiration was nearly always quickened. In 5 cases in which the respiration gave warning of impending danger, prompt measures were successful in restoring the patient.

The author is satisfied as to the safety of this anæsthetic, and thinks it is easily managed with average precautions. It is important to exclude rather than admit air. The apparatus should be well applied to the face. In small operations, it is decidedly preferable to chloroform, and for larger ones quite as useful.—*Brit. Med. Journ.*, Jan. 1, 1870.

7. *Sulpho-carbolates in the treatment of certain Diseases of Children.*—

Dr. SANSOM, in a paper read before the Obstetrical Society of London (Jan. 5, 1870), commenced by describing the chemical properties of sulpho-carbolic acid, and of its compounds with sodium, potassium, ammonium, calcium, zinc, and copper. The active agent in these salts is carbolic acid, which enters largely into their composition. The salts themselves are much inferior as direct antiseptics to the less stable carbolates, and when administered internally, they are apparently absorbed from the stomach without decomposition, and give off their carbolic acid by chemical change in the tissues. They are exceedingly soluble, by no means unpleasant to the taste, and never seem to produce toxic effects. Dr. Sansom then proceeded to describe the various cases in which he had used the salts, giving abstracts of a considerable number. Those in which he had found them most serviceable were zymotic diseases, especially scarlatina, measles, and diphtheritic sore-throat. In all of them he had met with strikingly beneficial results. In these he had chiefly employed the sulpho-carbolate of sodium, in doses of from five to ten grains every four hours. In rachitis, malnutrition, and diarrhœa, he recommended the sulpho-carbolate of calcium.—*Lancet*, Jan. 15th, 1870.

8. *Action of Citrate and Acetate of Potassa, of Spiritus Etheris Nitrosi, and of Oil of Juniper on the Urine in Health.*—Dr. F. B. NUNNELEY, of York, read a paper on this subject before the Royal Med. and Chirurg. Society Feb. 8, 1870. The author had made the necessary experiments upon himself; and the method pursued was to estimate the water, urea, and solids of the urine each day for about twenty-eight days, during the middle twelve days of which the medicine was taken, the days before and after being medicine-free. Citrate of potassa was taken to the extent of from 10 to 18 drachms in twenty-four hours; was found to increase the water by $2\frac{1}{2}$ ounces, and to diminish the urea

by 84 grains, and the solids by 60 grains. The acetate of potassa, in daily doses of from $2\frac{1}{2}$ to $3\frac{1}{2}$ drachms, exerted a similar influence in a somewhat less degree. The spiritus etheris nitrosi (10 to 18 fluidrachms in twenty-four hours) slightly increased the water, and diminished the urea by 54 grains, and the solids by 122 grains. The oil of juniper (30 to 40 minims in twenty-four hours) slightly increased both the urea and the solids.—*Lancet*, Feb. 19th, 1870.

9. *Physiological Researches on Nitrite of Amyl*.—Dr. B. SANDERSON gave an account to the Clinical Society of London (Feb. 11, 1870), of certain physiological researches on nitrite of amyl made by Dr. BRUNTON in Professor Ludwig's laboratory, which have just been published in the *Leipzig Transactions*. The purpose of these researches was to determine the action of nitrite of amyl on the circulation by exact experiments on animals. Rabbits were employed for the purpose. The results of the inhalation were recorded in each instance on the cylinder of the kymographion. They showed (1) that the effect of the drug is to diminish the arterial pressure; (2) that this diminution occurs as distinctly in animals in which the vaso-motor nerves have been paralyzed by section of the spinal cord in the cervical region as in the natural condition; (3) that nitrite of amyl does not diminish the work done by the heart in a given time, although it increases the frequency of its contractions; and, consequently (4), that the nitrite does not exercise its influence on the nervous system, but on the contractile walls of the bloodvessels, diminishing the arterial pressure by diminishing the resistance to the circulation. A question of great importance still remained to be determined experimentally—that of the action of the drug on other involuntary fibres, as, *e. g.*, those of the intestine. If it act in the same way as on those of the vessels, it is likely to be as valuable for the relief of multitudinous pains which depend on intestinal spasm as for those of angina. Dr. Sanderson also exhibited sphygmographic tracings showing the effect of nitrite of amyl on the normal pulse.—*Brit. Med. Journ.*, Feb. 26, 1870.

10. *On Atropia as a Physiological Antidote to the Poisonous Action of Physostigma*.—Dr. THOMAS R. FRASER contributes an interesting paper on this subject to the *Practitioner* for February, 1870. He details several experiments which show that the lethal effects of doses of physostigma greatly in excess of the minimum fatal, may be prevented by doses of atropia greatly below the minimum fatal; and that they likewise contain a most perfect demonstration of the power of atropia to prevent the lethal effects of certain doses of physostigma. These deductions are from experiments made on dogs and rabbits, in which animals the actions of physostigma and atropia are precisely the same.

In treating cases of poisoning in man, the sulphate of atropia should be given by subcutaneous injection, in doses of from the $\frac{1}{30}$ th to the $\frac{1}{20}$ th of a grain. The exhibition of the antidote should be persevered with, in repeated doses, until the pupils are fully dilated and the pulse rate increased, and probably, also, until the hypersecretion of bronchial mucus, which greatly impedes respiration, is completely checked.

This is scarcely the place to discuss the interesting and important question of the exact action or actions on which the antagonism between these two substances depends. It will be sufficient to mention that physostigma increases the excitability of the vagi nerves, while atropia diminishes and suspends this excitability; that physostigma diminishes the arterial blood-pressure, while atropia increases it; that physostigma greatly augments the secretion of the salivary, bronchial, intestinal, and lachrymal glands, while atropia diminishes and even completely checks these secretions; and that physostigma contracts the pupils, while atropia, to a much greater relative extent, dilates them. Besides these effects of the action through the blood, various opposed topical effects have been observed, among which is the contraction of the veins by physostigma—the existence of which rests on the high authority of Mr. Wharton Jones—and the contraction of the arteries by atropia.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

11. *Origin of the Globules of Pus.*—M. VULPIAN communicated to the Imperial Academy of Science (Feb. 15th, 1870) the results of experiments recently performed by himself and Dr. HAYEM, with the view of elucidating the question respecting the origin of the globules of pus. These experiments confirm in every respect the theory of suppuration propounded by Cohnheim. The globules of pus are nothing but the white globules of the blood which exude through the vessels in the vicinity of the inflamed part. M. V. quotes numerous observations made by himself and Dr. Hayem which prove this so satisfactorily that it is difficult to doubt its correctness.—*L'Union Médicale*, Feb. 17th, 1870.

12. *Origin of Tuberculosis.*—Prof. NIEMEYER contends that blood remaining in the bronchi after hæmoptysis leads to cheesy pneumonia, and later to disintegration of the tissue. Professor Traube is opposed to this, saying that the case of Niemeyer, where single thrombi were found in the bronchi *post-mortem*, did not prove much; nor did those cases of tuberculous disease where the temperature rose only a few days after the hæmoptysis. He had many cases of acute tuberculosis where death happened during the initial bleeding; but in no cases thrombi, much less disintegration, were found. Therefore, Niemeyer's case may be considered exceptional. First, it was not proved that, at the time when the thermometer indicated "no fever," there was none. But, if there were none, the first beginning of inflammation may have been very circumscribed; and, with the spread of inflammation, fever supervened. In the same way, it may have been impossible to detect the disease by auscultation in the beginning, it being perhaps confined to a limited part, or of small extent. *Brit. Med. Journ.*, Feb. 19, 1870, from Schmidt's *Jahrbücher*, 1869.

13. *Formation of Tubercles in Coagula of Blood.*—Prompted by a remark made by Rokitansky, in reference to the development of tubercles in blood coagula, Dr. BIESIADECKI, directed particular attention to the subject, to determine for himself the accuracy of Rokitansky's observation in this respect. During three years frequent opportunities occurred to him of observing the formation of tubercular deposits in large coagula of blood. In three cases the coagula were formed within the pleural cavity, and in one within the peritoneal. In all of these cases the surrounding serous surfaces were thickly beset with fresh tubercular deposits, while from the surface of the coagula were projected numerous bloodvessels engaged in the formation of pseudo-membranous adhesions. Upon the surface of the latter and of the coagula were numerous tubercular deposits, which here and there were found also deeply imbedded in the substance of the coagula. Under the microscope the tubercles presented themselves in groups, imbedded amid a fatty deposit within a recently formed fibrous network, surrounded by a clear zone of extremely protoplasmic white blood corpuscles. As to the conditions under which the development of tubercles in coagula of blood takes place nothing positive has as yet been made out.—*Centralblatt f. d. Medicin. Wissenschaften*, Feb. 6, 1869, from *Wien. Acad. Sitzungsber. Mathem.-Naturw. Cl. 2*, Abth. lvii. D. F. C.

14. *Tuberculosis.*—From the results of ten post-mortem examinations made at the Würzburg Pathological Institute, in cases selected from 109 cases of pulmonary phthisis, in all of which the presence to a greater or less extent of generally disseminated miliary tubercles was detected, conjoined with cavernous excavations or with traces of the results of old inflammatory processes, especially deposits of cheesy matter; Dr. HINKELDEYN disputes the accuracy of the theory of tuberculosis advanced by Buhl Dittrich, and more recently by C. E. E. Hoffman, namely, that miliary tubercles are the result of the resorption of a cheesy product, the deposit of which precedes always the formation of the tubercle. Dr. H. thinks that it is much more probable that the formation of tubercles is, in every instance, to be viewed as the primary change. When these

are widely disseminated and undergo speedy disintegration, a special process of inflammation is excited, which terminates in the formation of caseous matter.—*Inaug. Dissert, Würzburg, 1868, per Centralblatt f. d. Med. Wissenschaften, Nov. 20, 1869.* D. F. C.

15. *Tuberculous Stricture of Œsophagus.*—Dr. KRAUS describes the case of a man 47 years old, in whose Œsophagus had been formed a tuberculous swelling two inches broad, which had for the space of three years given rise to a sensation as though there had taken place a very close stricture of the gullet. A few days before the patient died, two extensive caverns which had been formed in the middle and lower lobe of the right lung, penetrated by ulceration the walls of the Œsophagus.—*Centralblatt f. d. Med. Wissenschaften, 1869, No. 50, from Allg. Wiener. Med. Zeitung, 1869, No. 19.* D. F. C.

16. *Brain of an Aphasic.*—The *Glasgow Med. Journ.* for Feb. 1870, contains an elaborate report by a committee on the brain of an aphasic, a patient of Dr. A. Robertson, in whom hemiplegia of the right side and aphasia co-existed with fair intelligence, which remained unimpaired to the close of life. This case gives support to the view which connects the expression of language with the left hemisphere, and more especially with the frontal lobe of that hemisphere. The symptoms during life were those of nearly pure aphasia. The patient was intelligent; language was in her mind, but *the power of expression* was all but lost. A very interesting feature in this case is the atrophy of the left crus cerebri and same side of the pons Varolii, and of the right side of the medulla oblongata—a condition which, if the brain had been fully dissected, would probably have been found to extend to the thalamus opticus, corpus striatum, and corpora quadrigemina of the left hemisphere. It is evident that the conductors passing to and from the palsied side and the hemisphere are wasted, showing that the central organs of the nervous system are, like other tissues, subject to the general law that, when an organ either partially or completely ceases to discharge the functions with which it was originally endowed, its nutrition is checked, it decays, and is removed. A few cases of similar atrophy of the central nervous system in hemiplegics have been recorded, especially by a German observer, Dr. Ludvig Türck, who traced the wasting down the spinal cord, usually in the anterior column of the side affected, and in the lateral column of the opposite side, thus so far corroborating the doctrine held by physiologists of the constitution of the spinal cord and the functions of its columns.

17. *Anosmia; Cases illustrating the Physiology and Pathology of the Sense of Smell.*—This is the title of a paper by Dr. WILLIAM OGLE, read before the Royal Med. and Chir. Society Jan. 25th, 1870. The author relates three cases which have fallen under his observation, in which total loss of smell was produced by a blow on the head, and he attributes the anosmia to rupture of the olfactory nerves, and points out how these nerves are especially liable to injury from blows on the occiput, which was the part struck in each case. Each patient complained not only of loss of smell, but also of loss of taste. True taste, however, was really unimpaired; what was lost was the power of recognizing “flavours,” which are sensations compounded of smell and taste. These cases afford an opportunity of drawing a clear line between taste and smell, and show that taste is limited to the perception of acid, salt, sweet, and bitter. These simple tastes compounded with smells form “flavours.” Various cases are then considered which seem in contradiction with this opinion—cases, namely, in which smell is apparently lost, and yet the perception of flavours remains. These cases are explained, and the contradiction shown to be only apparent. A second group of cases follows, in which anosmia resulted from lesion of the nerve centres. It is shown that anosmia is a frequent accompaniment of aphasia, and it is argued that the explanation of this is to be found in the proximity of the so-called external root of the olfactory nerve to the part of the brain usually affected in aphasia, a proximity which renders the two parts very liable to be involved in one common lesion. The relative importance of the external

and of the other roots of the olfactory bulb is considered, and it is held that the latter have little, if anything, to do in the perception of olfactory sensations. Lastly, a case of anosmia, recorded many years ago by Dr. Hutchinson, is discussed at length. A negro began, in his twelfth year, to lose his colour, and, in course of time, became perfectly white. The loss of colour was accompanied by loss of the sense of smell, almost, if not quite, complete. This seems to have been hitherto considered a fortuitous coincidence. The author argues that such is in the highest degree improbable, and accounts for the anosmia by the destruction of the pigment of the olfactory region. Numerous arguments are used to show that this pigment plays an important part in olfaction, and that the keenness of this sense in man and mammals depends, in great part, on the intensity and extent of nasal pigmentation. Reasons are also adduced for believing that pigment is of use in the reception of auditory impressions, so that there would be a certain similarity in this respect between the three main organs of special sense, the eye, the ear, and the nose. Finally, an hypothesis is advanced as to the manner in which the pigment operates, and especially as to the manner in which it operates in olfaction.

The President said the paper contained many most novel facts and much ingenious reasoning. As it would be impossible to discuss properly the theory brought forward, he would ask the Fellows for similar cases to illustrate the subject.

Dr. Althaus said the injury to the patient was usually insufficient to cause uneasiness at the time. Generally the condition of anosmia was discovered accidentally. The condition was not unpleasant, as in a patient of his who lived in Westminster, when the river was so bad some years ago, and who then congratulated himself on his loss of smell. He thought the condition more likely to depend on injury to the bloodvessels than on injury to the bone. In most cases aphasia was associated with this condition. A case related by Claude Bernard contradicted Dr. Ogle's theory. A woman died of consumption; her brain was healthy, but she had no olfactory nerves, yet she had liked flowers and disliked tobacco smoke. He had an anosmic patient who was very fond of the bouquet of moselle. This also contradicted Dr. Ogle's view. He had known to be associated with epilepsy a bad smell as an aura days before the fit.

Dr. Broadbent had seen two or three cases which confirmed Dr. Ogle, and, therefore, contradicted Dr. Althaus. One gentleman fell from his horse, fractured the ethmoid bone, and became anosmic. Two other cases came about much in the same way. There was no smell, and little taste. Salts, sours, and bitters could be appreciated. He had experimented on the case reported by Dr. Ogle, where the soft palate adhered to the pharynx. As the woman lost smell, so did she, *pari passu*, taste. In Bernard's case it was inferred merely that she had smell, as it was the motion of putting them to her lips which made them believe the woman was fond of flowers. He thought the injury to the olfactory to be most likely intracranial. He thought the external root of the olfactory of less importance than the middle and internal.—*Lancet*, Feb. 12, 1870.

18. *Paræsthesia of Taste*.—Dr. WERNICH, in the *Arch. f. Psychiatrie u. Nervenkrankh.*, states that in two of his patients, and once in his own person, he noticed, following an injection of morphia, the occurrence of a bitter, and on one occasion of a disagreeable, sourish taste, which was at once overcome by taking a drink of water. In the case of "hallucination" of taste, recorded by Rose, Dr. W. refers the abnormal phenomenon to an irritation seated at the nervous centre of the sense of taste. An interesting observation connected with this subject is that a condition of inanition, long-continued hunger, etc., would seem to favour the normal sensibility of the tongue to flavours.—*Centralblatt f. d. Med. Wissenschaften*, Dec. 18, 1869.

D. F. C.

19. *Local Development of Heat in Inflammation*.—Dr. G. LAUDIEN thus sums up the results of forty experiments made by him upon dogs and rabbits to determine the question whether there takes place an increase of temperature

in the neighbourhood of an inflamed part. 1. The temperature of the skin or of the muscular tissue, when the seat of intense inflammation, even to its lowest layer, in immediate contact with the bone, never rises as high as that of the upper portion of the rectum or vagina, nor as high as that of the abdominal cavity. The temperature of the internal portions of the body is always higher than the swollen and inflamed soft parts surrounding the place of fracture in a bone, or of the inflammation produced by the subcutaneous injection of a mixture of croton and castor oil, or by the application of hot oil, etc., in which cases there is experienced a sensation as though the heat of the inflamed parts is greatly increased. The difference amounted in the case of very intense inflammatory processes almost always to from 1° to 2° C., and varied only in four observations $\frac{1}{2}$ to 1° C. 2. The temperature of the inflamed localities was greater during the acute stage than that of the corresponding sound parts, when there does not occur from direct communication with the atmosphere, as in the case of open wounds, ulcers, etc., a constant loss of heat. The difference of temperature was the slightest the furthest removed the inflamed tissue from the surface of the body. In inflammation of a rabbit's ear, so long as the epidermis remained intact, the temperature rose from 4° to 5° C. In the inflammation of the extremities of dogs and rabbits the increase of temperature seldom amounted to 1° C.; usually it was from 0.2° to 0.5° C., and in some cases there was no increase. In the further course of the inflammatory process, when copious purulent infiltration, or the formation of a deep-seated abscess takes place, the part becomes, so far as regards its temperature, in some degree on a par with that of the sound limb. 3. The temperature of the arterial blood, procured from the crural artery in dogs by the introduction of very thin conical needles was found to be, as well by Dr. L.'s former experiments as by others still in progress, permanently higher than that of the blood contained in the arteries at the focus of inflammation, and towards which was its natural course.—*Centralblatt f. d. Med. Wissenschaften*, April 17, 1869. D. F. C.

20. *Certain Morbid Changes in the Nervous System, associated with Diabetes*.—Dr. WM. HOWSHIP DICKINSON read some interesting observations on this before the Royal Med. and Chirurg. Society, Feb. 8th, 1870. Diabetes has hitherto been regarded as a functional disorder, and has been attributed to erroneous action rather than structural change. This view, however, must be looked upon as only provisional. Function is simply the expression of structure; structure and function are as inseparable as cause and effect. Where, as in diabetes, function is permanently altered, it follows of necessity that there should be equally abiding change in the mechanism of the organs concerned. In this belief the various organs of diabetic subjects were subjected to a searching examination, and it was found that the nervous system was the seat of important alterations, an observation which gained significance from the discovery of Bernard that puncture of a certain part of the medulla oblongata rendered the urine saccharine.

[The details of the examination of the organs in five diabetic subjects were laid before the Society, and the pathological changes in the brain and cord illustrated by a series of drawings, representing their naked eye and microscopic appearances.]

The results obtained in the five cases were briefly these: Peculiar morbid changes were constantly found in the cerebro-spinal system. In all the alterations were of the same nature, and for the most part in the same situations. The earliest alteration recognized was a dilatation of the arteries. This was followed by a degeneration of the nervous matter at certain points external to them. An extension of the degenerative process occasioned destruction and excavation of the tissue around the vessel. Cavities were thus produced (often large enough to be striking objects even without the microscope), which contained bloodvessels, extravasated blood, grains of pigment, and the products of nervous decay. Finally, the contents appeared to become absorbed, so that simple vacuities were left.

As to their situations, the changes occurred in constant association with arteries. They were found in every part of the spinal cord and encephalon, at-

taining their greatest development in the medulla oblongata and pons Varolii. The excavations were frequently in connection with folds of pia mater, and were often disposed with lateral symmetry. Several spots were found to be affected uniformly in all the cases examined—namely, the olivary bodies, the vicinity of the median plane of the medulla, the gray matter of the floor of the fourth ventricle, and in particular a spot just internal to the origin of the facial nerve. This point presented a remarkable sameness in all the cases, a large excavation lying generally on both sides in connection with a process of pia mater. Another spot, which in four of the five cases presented a considerable cavity, was found near the front of the pons, in the median line, also in connection with the pia mater. The optic thalami and corpora striata were involved to a slight extent. The septum of the ventricles, and the white matter of the convolutions, displayed the alterations in a remarkable manner, as also did the corpus dentatum of the cerebellum. The changes especially affected the white matter, though the gray matter at the floor of the fourth ventricle and of the spinal cord are exceptions to this statement. The cells of the gray matter were generally perfect. The deterioration was not general, but was limited to the vicinity of the arteries. Such parts of the sympathetic system as were examined, namely, the upper cervical and semilunar ganglia, were apparently natural. The only constant change found in the viscera was epithelial accumulation in the liver and kidneys.

It would seem from the foregoing observations that diabetes is associated with an organic change, which may be briefly described as a destruction of the nervous matter along the arteries of the brain and cord. From the uniformity with which this was found in the five cases examined, it may be presumed that there was a more than accidental connection between the symptoms of diabetes and the peculiar state of the nervous centres. The question presents itself, whether the lesion is a result of the disease or its cause. The association of the morbid action with the bloodvessels suggests that it may be connected with the state of the blood. We know that the blood in diabetes is altered by the presence of sugar; is it to this that the deterioration of tissue is due? Several considerations militate against this, at first sight, probable explanation. The veins and capillaries appeared to take no share in the morbid process, though equally permeated by diabetic blood, which, in the capillaries at least, is brought into more intimate relation to the tissues than in the arteries. If the changes in the tissues were directly due to the altered composition of the blood, the capillaries could hardly fail to distribute its morbid influence. Besides this, the blood traverses the whole body without producing in any other organ an analogous failure of nutrition. We may probably abandon the view that the changes described are consequent upon the diabetic state of the blood, and have recourse to the supposition that the nervous alterations are antecedent to and productive of the glycosuria. The following considerations may be mentioned in favour of the latter supposition. No organic change has been found elsewhere to which the saccharine state of the urine can be attributed. The alterations in the brain are, in their nature and situation, exactly such as physiology has shown to be capable of producing that symptom. Further, we are the more disposed to regard the nervous changes as primary by the fact that alterations similar in kind, though differing in distribution, occur, as belonging exclusively to the nervous system, quite independently of diabetes. This is the case particularly in the general paralysis of the insane. Dr. Lockhart Clarke has, since most of the preceding observations were made, described the lesions in that disorder, and shown that, though differing somewhat in situation, they are of the same nature as those here described. The conclusion that diabetes is primarily and essentially a nervous disease accords with all that is known of its natural history; indeed, the opinion has, of late years, been gaining ground, that the disorder is due to altered nervous action, though no structural change was known to account for it. The urine often becomes saccharine in consequence of injuries of the head, apoplectic seizures, intra-cranial tumours, and other sources of cerebral irritation. These traumatic and accidental forms of the disease are, as we may believe, not necessarily accompanied by the grave and general lesions which have been under consideration. Several kinds of

irritation, if acting in the right situation, give rise to a similar change in the urine, though often temporary, and for the most part unaccompanied by the serious symptoms which characterize what may be termed "idiopathic" diabetes. Diabetes in its ordinary "idiopathic" form, though sometimes hereditary, and often taking its origin in causes which are not within our knowledge, continually results from circumstances which exert a depressing or otherwise injurious action upon the nervous functions; among them may be mentioned mental disturbances, rage, grief, anxiety, and toil, and the various forms of dissipation, among which sexual excess takes a prominent place. Causes of this nature may readily give rise to modifications of circulation in the nervous centres, and it has been shown that, as far as could be learned from the microscope, a widening or distension of the arteries was the initial change in the pathological series.

The foregoing observations concur in leading to the belief that diabetes essentially belongs to the nervous system, a consideration which may have a practical issue in modifying the treatment of the disease.

Dr. Lockhart Clarke bore testimony to the faithfulness with which the appearances had been described. They were precisely similar to those which he had met with in a case of general paralysis, and of which he had given an account in the last number of the *Journal of Mental Science*. As far as he knew, nothing like them had been described before. In his case, which was a typical one of general paralysis, the brain resembled Gruyère cheese, or crumb of bread. The bloodvessels in the brain were surrounded by the so-called perivascular sheaths, and these were contained in large channels in the brain-tissue. The structure of the perivascular sheaths underwent some thickening, and they had then been supposed by Rokitanski and others, to be an exudation; but they were natural structures. The cavities were not new formations in the brain, but were left by the destruction of the vessels and their sheaths. Dr. Dickinson had not referred to the mental state of his patients. In his (Dr. Lockhart Clarke's) case the cells of the convolutions were much altered, had undergone degeneration, and were loaded with pigment-granules. He had also found in a case of diabetes degeneration of the floor of the fourth ventricle, and erosion of the calamus scriptorius, with destruction of the nuclei of the vagus. It is very remarkable that there were cavities at the roots of the facial nerves, and in his case he had found the same.—*Lancet*, Feb. 19th, 1870.

21. *Polyuria in Chronic Renal Disease*.—DR. FINNY read a paper on this subject before the Medical Society of the College of Physicians. The author, after giving a short *résumé* of the symptoms and pathology of the cirrhotic and amyloid kidneys, in which polyuria is a prominent feature, referred to the difficulty of explaining the elimination of water in excess of that in health by the theory of filtration through the Malpighian corpuscles, since they are primarily and most extensively diseased. Regarding the true function of these bodies, Dr. Finny inclined to the view put forward by Dr. R. Southey as to their being blood-regulators. Stress was laid upon the fact that the *vasa recta* have a distinct arterial origin, as was first discovered by Virchow, and confirmed by Leydig, Beale, and others. The author considered that the secretion of both the solids and fluids of the urine took place from the epithelial investment of the tubuli uriniferi in their entire course, except just at the orifices of the straight tubes near the papillæ. The distinct vascular supply of the cones, their congested appearance in the amyloid disease, and their freedom from lesion in cirrhosis, imparted much probability to the view that, under these diseased conditions, compensatory work was done in the cones. Again, as the vessels supplying them increased in calibre, a flow of watery urine resulted, the presence of albumen being an accidental condition due to an escape of blood-serum through the walls of some of the capillaries, whether Malpighian or otherwise. In cirrhosis, several constitutional causes were no doubt at work besides those related to the kidneys; for example, a watery character of the blood, a strong cardiac action, and a dry state of the skin.—*Brit. Med. Journ.*, February 26th, 1870.

22. *The so-called Cerebro-pneumonia of Children.*—The *Centralblatt f. d. Med. Wissenschaften* (Nov. 20, 1869), quoting from the *Jahrb. f. Kinderkrankheilkunde*, 11, S. 357, states that Dr. STEINER has presented an accurate description of the movements liable to be produced in the character and course of the croupous pneumonia of children, by the occurrence of acute cerebral disease. Symptoms of cerebro-meningitis often make their appearance in such cases so early in the attack, and are of so prominent a character that, without a close physical exploration of the chest, the physician may be misled into a belief that he has to deal with simply a primary case of meningitis or other acute disease of the brain. This is owing to the promptness with which in children the brain is liable to participate in the inflammatory condition of the other organs. Dr. S. has treated sixteen cases of the so-called cerebro-pneumonia, in which there was present also a purulent inflammation of the inner ear. These cases were in children from 5 to 10 years old, and who had at no former time suffered from any affection of the ear, but had been previously in all respects perfectly healthy. In ten, males, the inflammation was confined to one ear, and in six, males, both ears were affected. That in all these cases the otitis was directly connected with the cerebral disease, Dr. S. thinks was fully shown by the fact that simultaneously with the occurrence of the purulent discharge from the ear, the symptoms of cerebral disease speedily disappeared.

D. F. C.

23. *Softening of the Coats of the Œsophagus in an Adult.*—To the cases already published by him of softening of the Œsophagus in the adult (*Centralblatt*, 1868, S. 839), Dr. HOFFMAN adds another which occurred in a parturient female aged 27 years. She was seized with a severe attack of erysipelatosus disease attended by fever of a very intense grade, speedily terminating in death. On the posterior wall of the Œsophagus there existed a hemorrhagic infiltration of the mucous coat about three cm. in extent; in the midst of this there was a small opening with brownish fatty edges, through which there was poured into the left pleural cavity a quantity of coffee-coloured fluid. The serous covering of a lower portion of the left lung was to a considerable extent eroded, as it were, apparently from immersion in this fluid. In the stomach was contained a large quantity of the same dark-coloured fluid. The coats of the organ presented nothing abnormal.—*Centralblatt f. d. Med. Wissenschaften*, Dec. 25, 1869, from *Virchow's Arch.* xlv. S. 124.

D. F. C.

24. *Case of Chronic Invagination of Intestines.*—Dr. SPATH describes the case of a tailor, 36 years old, who had from the period of his apprenticeship suffered from repeated attacks of colic. Within the last six months these attacks had increased in severity and recurred at shorter intervals. The greatest ease was felt when subsequent to a paroxysm of pain a discharge from the bowels, but seldom spontaneously, took place. Within a week or two of the final result a soft swelling, painful to the touch, appeared to the left of the navel, soon after which diffused peritonitis suddenly set in, under which the patient quickly sunk. On examination after death, the cavity of the abdomen was found to contain a quantity of fecal matter. There was diffuse suppurative inflammation of the peritoneum, and a most extensive intestinal invagination. The cæcum and a portion of the ascending colon had, as it were, disappeared; the remaining portions of the large intestine forming a sheath into the cavity of which the apparently absent portions of the intestine had become involved. The enormously enlarged cæcum, of which the muscular coat, hypertrophied, hardened, and fatty, had attained the thickness of 2.6 m., had burst through the anterior gangrenous wall of the ensheathing intestine, and turning upwards outside of it, pressed upon the abdominal parietes, giving rise to the soft tumour formed before death to the left of the navel. Between the serous surfaces of the escaped cæcum and of the colon upon which, in turning up, it rested, there had taken place numerous tolerably firm adhesions. Those around the upper portion of the cæcum formed a kind of annular stricture, including all the coats of the invaginated portion. While the large intestines were in part gangrenous, the incumbent coil of small intestines, with the exception of being much dis-

tended with gas, did not exhibit any morbid changes. Within them were found a few dry hard masses of fecal matter. Dr. S., from a comparison of the clinical and anatomical facts connected with this case, concludes that the invagination had been of some six months' existence.—*Centralblatt f. d. Med. Wissenschaften*, 1869, from *Würtemb. Med. Corresp. Blt.* xxxix. 19. D. F. C.

25. *Angina Pectoris relieved by Nitrite of Amyl.*—Two cases of this were communicated to the Clinical Society of London, Feb. 11th, 1870.

The first was by Dr. LAUDER BRUNTON. The patient, a man *æt.* 26, was in the clinical wards of the infirmary, Edinburgh, during four months, under the care of Professor Bennett. He had had seven attacks of acute rheumatism, and had suffered from symptoms of disease of the heart for several months. When admitted, he presented the physical signs of aortic obstruction and regurgitation with hypertrophy of the left ventricle, and suffered during the whole of the time that he was in hospital from severe paroxysms of præcordial agony, the pain extending from the chest to the right side of the neck and the right arm. These attacks occurred mostly during the night, each lasting one or two hours; they were not relieved by aconite, digitalis, or by stimulants, but the patient was considerably benefited by small bleedings. During an attack of acute rheumatism, the pain entirely disappeared. Six weeks after admission, treatment by inhalation of nitrite of amyl was commenced, a few drops only being employed at a time. The pain was relieved, or rather ceased, as soon as the characteristic symptoms of the physiological action of the drug manifested themselves—*i. e.*, flushing of the countenance and amplification of the pulse. On many occasions, the effect of the remedy was observed with the aid of the sphygmograph. The tracings showed (1) that the arterial expansion is much diminished and the arterial tension correspondingly increased during the paroxysm of angina, the smallness of the pulse being due to its hardness; and (2) that, under the influence of nitrite of amyl, the arterial tension is diminished and the expansive movement increased by the direct influence of the compound in relaxing the muscular walls of the arteries. Dr. Brunton concluded that nitrite of amyl is of great value as a means of affording immediate relief in all cases in which pain is due to arterial spasm.

The second was by Dr. ANSTIE. The patient was a gentleman *æt.* about 50, of a highly nervous temperament, a sufferer for the last twenty years from spasmodic asthma, and very liable to facial neuralgia. Between four and five years since, he began to suffer from severe and frequently recurring attacks of angina pectoris, and his life was for a long time in much danger. By the use of sulphuric ether in large doses, and of considerable quantities of alcoholic stimulants, the attacks were diminished in frequency and violence; but they recurred at intervals, whenever the patient was much fatigued or excited in the course of his professional work. In December last it was determined to try the nitrite of amyl, and, on the recurrence of the next anginal spasm, the sufferer took one long and powerful inspiration through one nostril from a half-ounce bottle of the drug. After a pause of a few seconds, the characteristic flushing of the face and sense of fullness in the head were induced, and the patient instantly passed from agony into a state of perfect calm repose. The experiment has been several times repeated on the recurrence of the heart-pang, and always with complete success; and the patient has been able to entirely dispense with the disagreeable necessity of taking large and frequent doses of ether, and also greatly to reduce his allowance of stimulants. There has also been much less trouble than formerly from asthma, and he has obtained far more natural sleep at nights. The angina, although very severe, appears to be purely neurotic; no cardiac change, or at most a small amount of dilatation, can be discovered by the most minute physical examination. From some further observations, Dr. Anstie believed that nitrite of amyl is a relaxer of spasm in all involuntary muscular fibre, and that it would be particularly useful in colicky affections. He would not, however, advise its use by aged persons or others who might be likely to have commencing degeneration of the minute vessels of the brain, for fear of apoplectic accidents.—*Brit. Med. Journ.*, February 26, 1870.

26. *Arseniate of Antimony in Pulmonary Emphysema*.—Dr. KOCH recommends the employment of this remedy in emphysema, not only on empirical grounds, but because he considers it may reasonably be regarded as a nervine and muscular tonic. Hence, since in emphysema the pulmonary vessels are dilated and inelastic, rendering them incapable of contracting in the act of inspiration, the administration of the arseniate effects improvement through its invigorating influence on the contractile fibres, enabling the respiratory acts to be more easily accomplished. Again, the arseniate is particularly efficacious in those cases in which there are frequent attacks of asthma; for these are induced either by centripetal or centrifugal irritation of the spinal cord and medulla oblongata. The *point de départ* of the attacks is either peripheric or central. It is peripheric when the branches of the pneumogastric are acted on at their extremities by any cause, as vitiated air, a temperature too cold or too hot, which may lead to congestion of the neurilemma, or otherwise interfere with the nervous current. In such cases the arseniate of antimony, employed in the form of fumigations, produces excellent results. Both metals have an elective action on the lung, and are eminently sedative and capable of relieving congestion. When, however, the attacks of asthma are due to emotion, or to some other centrifugal action, there is little chance of benefit from this mode of treatment. The arseniate is employed in the form of cigarettes, containing a definite proportion of the drug, and the smoke taken into the mouth is slowly and gently inhaled into the lungs.—*Practitioner*, March, 1870, from *La Presse Méd. Belge*, No. 5, 1870.

27. *Hiccough treated by Mustard*.—Dr. JANUARIZ reports in the *Siglo Médico* the case of a Spanish physician, who, during convalescence from an attack of enteric fever, had obstinate hiccough, which lasted three days, in spite of antispasmodics, narcotics, counter-irritants, etc. He desired his wife to prepare him some infusion of linseed; she gave him by mistake an infusion of mustard, which had the effect of at once and permanently curing the hiccough. He afterwards tried the remedy on some of his own patients, with this same result, and Dr. Januariz has given it successfully in three cases where the symptoms had lasted several days. The dose is a teaspoonful of mustard in four ounces of boiling water.—*Brit. Med. Journ.*, January 29, 1870, from *Bull. Gén. de Thérap.*, January 15, 1870.

28. *Treatment of Dropsy by Milk Diet*.—Assistant-Surgeon J. FAWCUS, M.D., Superintendent, Alipore Jail, states (*Indian Med. Gaz.*, Jan. 1, 1870) that "the treatment of dropsy by a pure milk diet has been practised by Indian *kobiraj*es for ages, and within the last two years a Russian physician has made known the treatment in Europe. I commenced the treatment three years ago, and am convinced that it has prolonged the lives of many; whose cases would have been considered hopeless with any other treatment yet known. The cases for which I think it most suitable are those of anæmia with ascites and anasarca, which result from malaria, and are accompanied with impaired nutrition leading to pigmentary and fatty degeneration. The treatment is also beneficial in the cases of chronic dysentery in which the same alterations of the tissues are found. I am inclined to believe that the milk treatment has the effect of counteracting the defective nutrition which leads to an accumulation of fat in the liver, for I have found either no fat at all, or a very small quantity, in the livers of patients who died of chronic dysentery after having been subjected to the milk treatment; whereas under ordinary circumstances the liver in chronic dysentery is loaded with fat. Sufficient evidence, however, to prove that this is the correct theory of the action of the milk treatment has not yet been collected.

"The treatment consists in giving the patients absolutely nothing but milk, not even water. At first two pints per diem are allowed, and the quantity is gradually increased according to appetite, until it amounts to eight pints daily, or even more."

Dr. F. relates five cases of dropsy successfully treated by this mode, and adds: "Besides the above, many other prisoners have been cured of dropsical

affections by the milk treatment, and some of these are now doing their regular task in jail. It is unnecessary, however, to give further details, as these five cases are sufficient evidence of the value of the treatment. The treatment has been found to be equally successful in the Dullundah Lunatic Asylum. There is sometimes difficulty in persuading the patients to submit to the treatment, on account of the intense craving for solid food. This difficulty, I have no doubt, will occasionally in private practice be insurmountable."

29. *Ergot to Arrest Excessive Perspiration*.—Dr. CHRISTMAN, it is stated, in the *Würtemb. Med. Corresp. Blatt*, 1869, No. 20, has seen in many cases of excessive perspiration, a diminution of the cutaneous discharge ensue promptly upon the exhibition of ergot (8 to 10 grammes four times a day).—*Centralblatt f. d. Med. Wissenschaften*, Nov. 20, 1869. D. F. C.

30. *Variola, Varioloid, Varicella*.—Dr. WOLFE, in reference to the relationship of these three diseases, maintains that they are simply results of the action upon the system of one and the same virus, but of different degrees of intensity. This opinion is based upon observations made during a variolous epidemic which prevailed in a hotel of cadets, during which there occurred simultaneously, in common with cases of genuine, unmodified variola from contagion, cases also of unquestionable varicella and also of varioloid. Dr. W. further remarks that he has often observed the occurrence upon the skin of a true vesicular exanthem to be preceded by the same scarlet efflorescence as is usually observed to be a precursor of admitted variolous disease. Further, he has found the eruptive fever in cases of varicella of extraordinary severity, and the eruption to be attended with severe anginose suffering as in unmodified variola, and the eruption to terminate not by a small hard exfoliation, but with a genuine scab, leaving on its separation a permanent cicatrix.—*Centralblatt f. d. Med. Wissenschaften*, April 17, 1869, from *Deutsche Klinik*, No. 7. D. F. C.

31. *Cutaneous Pruritus of the Outer Meatus of the Ear*.—Dr. GRUBER by the name cutaneous pruritus indicates an intolerable itching of the external meatus auditorium, which occurs in paroxysms, often periodical, but usually varying in duration and frequency. It is entirely unconnected with the itching alluded to by Hebra as the result of *eczema* of the same locality. The cutaneous pruritus of the ear is attended by no other objective or subjective primary symptom save the itching. It occurs for the most part in persons of middle age, especially those labouring under some disturbance of the circulation. As palliatives for the itching, Dr. G. advises soothing watery or oily preparations to be dropped into the ear. For radical cure he employs a solution of nitrate of silver (6.0 to 8.0 grs. to the ounce of distilled water) with which the parts affected are to be frequently pencilled until the paroxysms of itching no longer recur. There are no doubt cases in which an internal depurative treatment will be found to expedite the cure.—*Centralblatt f. d. Medicin. Wissenschaften*, March 20, 1869, from *Allgem. Wien. Med. Zeitung*, 1868, 52. [We have met with many of the cases of pruritus of the ear described by Dr. G. They have never given us any trouble when we were able to place our patients under favourable hygienic circumstances. As local applications we have received great advantage from strong solutions of borax or of sulphate of zinc; in some obstinate cases we have derived prompt relief from a solution of carbolic acid in glycerine applied locally.] D. F. C.

32. *Internal Use of Carbolic Acid in some Cutaneous Affections*.—Carbolic acid has been employed rather extensively in the wards of Professor Hebra, of Vienna, with results of considerable interest, which are reported by Dr. Moritz Kohn. Under it hyperemia of the skin diminishes and finally disappears, a brown discoloration remaining; exudations become absorbed, and the formation of scales ceases. Cases of psoriasis, of pityriasis, and of pityriasis rubra have been rapidly cured by the use of this remedy without any external application whatever.

It is worthy of remark that during the internal administration of the remedy

the urine was not found to present the dark colour and tarry odour which is observed after the liberal application of carbolic acid to wounds after operation. It affects the kidney a little, when long administered; for example, a little albumen was observed in the urine, and epithelial cells from the tubuli uriniferi and the pelvis of the kidney were noticed. No troublesome urinary symptoms were, however, discovered.

Carbolic acid seems to possess a powerful effect on diseases accompanied by severe itching of the skin. Prurigo and pruritus cutaneus having been found to yield to its use in a remarkable manner—the itching in some cases ceasing almost immediately after its administration.

The form in which the remedy is best administered is that of pills. Each pill contains one grain, with four grains of some inert powder, and of these six to nine are administered daily at the beginning, the number being subsequently increased to from twelve to twenty. As much as a drachm of carbolic acid has been administered daily without injury, but so large a quantity is not necessary to produce the therapeutic effects. Dr. Kohn observes that in cases in which carbolic acid was found of decided utility, its beneficial effects were shown at a very early period after the commencement of its administration, often after a single day; and that in cases in which it failed to produce benefit early, it usually failed altogether—*Dublin Quar. Journ. Med. Sci.*, Nov. 1869, from *Archiv. für Dermatologie und Syphilis*. Prag. 2 Heft, 1869.

33. *Treatment of Psoriasis*.—Dr. PASSAVANT, in a letter to Prof. Hebra, recommends, as a specific remedy for psoriasis, the employment of an exclusively animal diet. Dr. Passavant's first experiment was made upon himself. He has suffered for twenty-five years from this disease, which ultimately affected the entire surface of the body, notwithstanding the trial of all the ordinary remedies. When the affection was at its height, both in point of extent and in severity, he experimented on the effects of an exclusively animal diet: immediate improvement was observed, and after a few weeks he was perfectly well. Dr. Passavant states that he has seen another case of psoriasis treated in a similar manner, in which the scabs entirely disappeared in the course of six weeks. On the patient's returning to an ordinary diet a relapse occurred, which was again overcome by a return to an exclusively animal diet. Dr. CASPARI, in some observations on this mode of cure, observes that he has had no opportunity of trying it, but that he is himself an example of the curative effect of a precisely opposite plan of treatment. It appears that, like Dr. Passavant, he has been for full thirty years subject to psoriasis, affecting the whole of the body, together with the upper and lower extremities. He also had tried all kinds of remedial means without effect; but some years ago, in consequence of a chronic catarrhal affection of the stomach, he was unable for many months to take anything for breakfast beyond a cup of milk with a little bread, soup and rice for dinner, and milk porridge for supper. His practice being considerable, this diet was insufficient to maintain his physical powers, and he gradually lost weight, but coincidentally his psoriasis vanished: it was starved out.—*Practitioner*, March, 1870, from *Deutsche Klinik*, Dec. 18, 1869.

34. *India Rubber Cloth in the Treatment of Skin Diseases*.—Prof. HEBRA learned from Prof. Hardy, when in Paris in 1867, that the latter had used very advantageously vulcanized India-rubber cloth in the treatment of eczema. On Prof. Hebra's return to Vienna he adopted this measure, and has published (*Archiv. für Dermatologie und Syphilis*, 1869) the result of a year's experience with the vulcanized India-rubber cloth not only in eczema, but in various scaly eruptions.

He says (*American Journal of Syphilography and Dermatology*): "We have subjected to this form of treatment every variety of eczema, from the scaly to the pustular form, using either closely-applied pieces of India-rubber cloth, or bandages, or clothing made of that material. In every case the smooth side of the cloth was brought in contact with the skin, the products of the disease—scales, crusts, &c.—either having been first removed, or else, by way of experiment, the cloth sometimes applied directly over these. If the India-

rubber cloth be removed after twelve or fourteen hours, it appears very moist—sometimes permeated by moisture—and the fluid which has collected in great quantity on the surface of the skin has a very penetrating and disagreeable odour. The skin itself, however, after having been cleansed from its superimposed collection of softened skin secretions, was odourless, reddened, somewhat deprived of its epithelial covering, moist and shining. While the India-rubber was applied, the patient experienced no disagreeable sensation—neither itching nor pain after removal of the covering; however, itching immediately re-occurs, and if it is not replaced for some time—say half an hour—a sense of tension and pain commences. If the treatment is continued in this way, the whole train of symptoms diminish—moisture, redness, itching and pain—and in many cases the cure of the eczema will occur at the end of two months. As is well known, a cure of eczema can be effected in the same space of time by various means. The question then arises, what advantage does the caoutchouc treatment offer above any other? The answer is, that if no especial advantage can be recognized in India-rubber, nevertheless there are some cases in which this form of treatment can be more beneficially employed. I refer to cases of eczema of the hands, fingers, large joints, scrotum and feet, in which the application of salves is attended with many inconveniences to the patient. Moreover, the India-rubber preparations are calculated to relieve the pain caused by fissures, because the impermeable covering keeps the part continually moist, which can be done by the application of India-rubber gloves, finger-stalls, bandages closely applied, suspensories, and stockings. If, therefore, by the use of caoutchouc in the treatment of eczema, no new panacea has been introduced into the therapeutics of skin disease, yet it must be recognized as a very valuable addition; and so much the more, as it does not forbid the use of any other application. Thus, in many cases, the cure of eczema is materially assisted by the simultaneous use of soap, baths, douches, preparations of tar; and these last are rendered more efficacious by the use of caoutchouc cloth. There are other diseases of the skin, especially the callous thickening of the epidermis, in pityriasis, xerosis, psoriasis palmaris, as well as in zylosis of the sole of the foot, where India-rubber stockings render the painful fissures painless immediately, and their continued use will induce a cure. In some cases of burns of the second degree, the same plan of treatment was attempted, and it succeeded perfectly; but at the same time I could not attribute it to any advantage over cold or lukewarm applications, or the use of the common ointments, lime-water and sweet oil, &c. In order to macerate the epidermic covering of the smallpox eruption, so as to favour the re-absorption of the contents of the pustules, or to promote their discharge, I attempted the application of the India-rubber cloth—that is, I applied India-rubber bags to the extremities, changing them every twenty-four hours, and cleansing the skin. The course of the smallpox, indeed, was not in the least changed by this mode of treatment; only the marked maceration of the thick epidermis on the soles of the feet and palms of the hands decreased essentially the pain so often present in these regions, and this was the only advantage in this form of treatment. India-rubber was most effectual in four cases of general pruritus, which certainly commenced in connection with eczema, but also extended to non-eczematous portions of the body, and could properly be designated as pruritus cutaneus senilis. Four old men between sixty-five and seventy-five years of age were the victims of this disease—one only in hospital, the other three in private practice. In all four patients I had complete suits of the vulcanized cloth made, and made them at the first wear them day and night next to the skin, the garments either to be changed night and morning, or if, as in the case of the hospital patient, only one suit was to be obtained, it should be taken off for a short time, washed, cleansed, and again put on. The effect of treatment showed itself from the first day, in the fact that sweat was secreted more freely, itching and tension of the skin subsided, and sleep returned. The patients were all pleased by the result, and submitted gladly to further treatment. After the expiration of a few weeks the India-rubber clothes were worn either only at night or for a few hours during the day, until, after complete convalescence, they could be removed. The eczema, too, could be so much the more readily treated with the usual applica-

tions, tar, &c., as the caoutchouc covering modified the odour and prevented staining.

"In conclusion I must reiterate that the India-rubber treatment can be relied on to obviate the itching and tension; but for the relief of the eczematous inflammation, tar, &c., must be used."

35. *Uses of Carbolic Acid*.—Dr. GIBB, of the Monkland Iron Works, states that, following the recommendation of Dr. Jones Gee and others to sponge the patient with tepid water, and subsequently to grease the skin with mutton suet, in scarlatina, he has found the addition of carbolic acid, in the proportion of one to twenty of the suet, to afford very considerable relief. In otorrhœa he has found great advantage accrue from sponging the ear with tepid water, and carbolic acid one to forty, and subsequently dropping into the meatus a little of the following mixture: Glycerine one ounce and a half, carbolic acid one drachm, sedative liquor of opium (Battley's) twelve minims. The fetid discharge is thus arrested. In throat complications he has obtained marked benefit from the use of Dr. Neilson's "inhaler," to the sponge of which are added a few drops of carbolic acid and Condy's fluid in equal proportions, requiring the patient to inhale the impregnated steam several times daily. As to the treatment of burns and scalds by means of carbolic acid, Dr. Gibb cannot speak too highly. In the Monkland Company's Works upwards of 1600 workmen are employed, and burns are of frequent occurrence. He finds the addition of carbolic acid, in the proportion of one part to twenty of the ordinary carron oil, the best treatment, and adds one grain of acetate of lead to the ounce of lime-water before mixing it with the olive oil. The plan he adopts is to saturate most thoroughly several sheets of ordinary surgeon's lint with the above mixture, and entirely envelope the parts; over this he applies a thick layer of cotton-wool, which is removed every second day, to enable a further coating of the mixture to be applied to the lint, which he does not disturb, by means of a feather or fine brush. In one case the whole trunk was skinless; after the lapse of several days all the dressings were removed, and it was found that a new skin had formed. During all this time not a drop of pus could be detected, nor was any other unhealthy action present.—*Practitioner*, Feb. 1870, from *Lancet*, Dec. 11, 1869.

SPECIAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

36. *Traumatic Tetanus treated by Calabar Bean and Division of Posterior Tibial Nerve; Recovery*.—Mr. S. WOOD communicated the following very interesting case to the Shropshire Scientific Branch of the British Medical Association:—

J. E., aged 60, was admitted into Salop Infirmary, on May 6th, 1869, with compound fracture of the proximate phalanx of the left great toe, caused by a cut with an axe. It was a clean cut, nearly severing the toe. He had lost a considerable quantity of blood when admitted. The parts having been brought into apposition, the wound was dressed with water-dressing. He was ill-nourished, having gained a precarious living by begging, and, at times, had been in the habit of drinking freely. He went on well without a bad symptom until the 25th, three weeks after the injury, when he first complained of stiffness about his jaws, and difficulty in opening his mouth. His countenance was pinched and anxious. He was ordered a dose of turpentine and castor oil, and put upon milk, beef-tea, and wine. On May 27th, the symptoms were more marked; there was pain in the nape of the neck, and rigidity of the abdominal muscles. He could only open his mouth slightly, and swallowed with difficulty. He was then ordered a twelfth of a grain of extract of Calabar bean, every four hours, by the mouth.

On the 28th the symptoms were most urgent. The dose of the extract was

increased to a quarter of a grain every four hours. He could only swallow liquids, and that with difficulty, and small quantities at a time.

On May 29th he had more difficulty in swallowing. The symptoms came on in paroxysms; there was opisthotonos. He was ordered brandy and beef-tea enemata three times a day, and a third of a grain of the extract dissolved in eighteen minims of water, to be injected under the skin every three hours. This was followed by considerable relief; and, after four injections, he was well under its influence.

May 30th.—He passed a tolerable night; but, the effect of the bean having passed off, the symptoms returned, as severe as ever. The wound was looking healthy. There were cramps in the legs. The posterior tibial nerve was divided behind the inner malleolus, and the subcutaneous injections were ordered to be continued.

On the 1st, 2d, 3d, and 4th of June the symptoms continued as aggravated as ever, except whilst he was under the influence of the bean. While under its influence, the paroxysms almost disappeared, and in about an hour after its administration he was able to take copious draughts of milk, beef-tea, and wine, although immediately before, he was unable to swallow at all without bringing on an attack.

June 5th.—He was much better; no paroxysms. He complained chiefly of pain and some cramp in the legs. One-third of a grain was injected night and morning.

June 6th.—The pupils were greatly dilated. He was delirious; he passed his motion under him. The wound was looking healthy. One-third of a grain was injected at 10 A. M. Half an hour after the injection the pupils were contracted almost to a point. As the hypodermic injections had given rise to several abscesses, and had caused great irritation, they were omitted; and one and a half grains were administered as a suppository at 5 P. M. and 10 P. M. He was also injected with half a grain of acetate of morphia at 9 P. M. and 11 P. M.

June 7th.—The rigidity and delirium were less; the pupils natural. The suppository was repeated at 10 A. M. and 6 P. M. He passed a quiet day.

June 8th.—He passed a good night. Another suppository was administered at 11.30 A. M.

June 9th.—He was quiet and comfortable. There was slight rigidity. The patient still passed motions under him; he, however, was not unconscious of the act, but was afraid to use the bed-pan lest it should bring on an attack. The suppository was repeated night and morning.

June 10th, 11th, and 12th.—He was going on well.

June 13th.—He had diarrhoea, which was checked with compound kino powder.

June 15th.—The morning suppository was omitted. From this time the tetanic symptoms gradually disappeared, but his recovery was retarded by the appearance of whitlow symmetrically on both hands, running up into the forearms. He was discharged convalescent on the 27th of July, 1869.—*Brit. Med. Journ.*, Jan. 15th, 1870.

37. *Whiskey as an Antiseptic Dressing in Surgery.*—Dr. DAVID BLAIR gives an account (*Glasgow Med. Journ.*, Feb. 1870) of his experience in this matter. He states that as a dressing to wounds he has found whiskey not only efficacious, but easily applied. He usually applies the whiskey as follows:—

“To remove foreign substances or clotted blood, the wound is first washed thoroughly with strong whiskey; it is then closed with stitches if necessary; again bathed with whiskey, and covered by a rag and bandage both saturated with the same fluid; and finally, all is enveloped in gutta percha tissue or oiled silk, and directions given to the attendants to wet the bandage from time to time with the spirits. As a rule, the first dressing is not disturbed for three or four days, and afterwards it is changed every day, or every second day, according to circumstances. The principal thing to be attended to is to have the bandage kept wet with the whiskey—but not *too wet*, or it will impede the progress of the cure. I have never seen *much* sloughing, and I have not once

seen erysipelas occur in wounds treated in this way. Probably because septic germs, if they exist at all, are not numerous in our hyperborean regions."

He has also used whiskey as an application to bed-sores. He says he has seen more than one case in which the os sacrum and coccyx were exposed from sloughing in typhus, and yet the patients recovered. The bed-sores were treated with linseed and oatmeal poultices, mixed with whiskey, until the slough separated, then whiskey lotions were applied.

"In cases of chronic and scrofulous abscess, I have used whiskey as an injection, and find that it checks the discharge and hastens the cure. In a case of scrofulous abscess of the hip-joint I attribute the recovery of my patient to its having been used in this way. The pain and hectic before and for some time after the abscess was opened, caused so much prostration that I had slight hopes of my patient's recovery. I persisted, however, in using the injections two or three times daily, bathed the whole limb often with spirits, and kept it wrapped in cotton wadding and a bandage. The stomach for a time would not tolerate solid food of any kind, and even beef-tea provoked nausea. Notwithstanding, in an incredibly short time, my patient rallied, and I had the pleasure of seeing him able to walk well, although the joint continued somewhat stiff.

"In a singular case of abscess, situated beneath the muscles in front of the abdomen, which opened at the umbilicus, I was highly pleased with the result gained by these injections. The discharge obstinately continued, although I perseveringly applied for a considerable time poultices and lotions of different kinds; at last I resolved to inject with strong spirits, but from the peculiar situation of the abscess, and fearing inflammation might supervene, I used it very cautiously at first, but no unfavourable symptom having followed the first application, by degrees it was used more freely—two or three syringefuls at a time repeated twice or thrice daily. In a few days there was a marked improvement, and soon the discharge ceased completely, and the patient is now well.

"Alcoholic lotions, as our readers are aware, are now used in some of the Parisian hospitals, and it is said with very satisfactory results. If alcohol should prove to be as good an antiseptic dressing as carbolic acid, the former, being more readily procurable, and its odour less disagreeable, will to a great extent supersede the latter."

38. *Torsion of Arteries*.—MR. COOPER FORSTER, in a paper read before the Clinical Society Dec. 10, 1869, said that having been selected by the Council of the Society as one of a committee to report upon the relative advantages of this procedure and acupressure, and no report having been made in consequence of the death of one of the committee, he felt it right to offer the Society his individual opinion upon the question. Having made some remarks upon the advantages of acupressure, and stated that, though still practised in Aberdeen by Keith and Pirrie, it was but little used in London, the speaker remarked that he had lost two cases from bleeding when the pins were removed, and that these accidents occurred after considerable personal experience in the practice. He considered acupressure valuable, but claimed for torsion precedence over all other modes of arresting hemorrhage, because it possessed the great advantage of not leaving any extraneous body in the wound. In proof of its efficacy he read several cases of amputation, as having occurred under his own care, in which torsion alone was employed for arresting hemorrhages. In addition to these amputations, Mr. Forster mentioned that he had excised the elbow-joint once, the knee three times, and the hip four times, during the last few months, besides performing other operations (about forty in number), in all of which torsion of arteries was exclusively employed. He therefore considered that a fair trial had been given to the plan, and that hence he might speak with some confidence as to the results. He confessed to reading with surprise, in Mr. Nunneley's able address to the British Medical Association, remarks to the effect that "he (Mr. Nunneley) could not twist a large artery and rest comfortably in bed, lest the elastic artery should untwist itself, and the patient bleed until he slept to wake no more." Mr. Forster was convinced that, had Mr. Nunneley perused carefully an account of the manner in which vessels were

closed by torsion, the notion of an artery untwisting itself would seem to be an impossibility. Drawings were shown by the speaker representing the two femoral arteries of a double amputation hardened in spirit, and divided sectionally by Mr. Howse; and the fact was particularly emphasized that the twisted part showed no signs of death, though the patient from whom the preparation was taken did not die until thirty-six hours subsequent to the operation. Mr. Forster assured the Society that in no single case recorded, or at any time under his care, had secondary hemorrhage occurred; and the conclusion at which he had arrived was, that the greater security of torsion arose from the reduplication of the middle and internal coats, thus affording a mechanical impediment to hemorrhage, which impediment increased day by day. But in acupressure, as he had shown in the 14th volume of *Guy's Hospital Reports*, the clot which formed above the pin was the only safeguard against hemorrhage. As the removal of the pin a day or two subsequent to the operation was necessary, it must always be a matter of some uncertainty as to whether the clot was sufficiently adherent to afford the necessary security against bleeding. In the practice of torsion a vessel is made secure at the time of twisting—that is, bleeding is arrested with certainty, and there is no chance of its recurrence. But in cases where acupressure or the ligature is employed, there must always be some anxiety on the part of the surgeon as to the removal of the pin in the one case, or the separation of the ligature in the other. Mr. Forster further stated that since February 1867, he had never used a ligature to restrain bleeding from an artery.

A very excellent preparation of the arteries above referred to was handed round for examination, as also the forceps used by Mr. Forster.

In reply to a question from the President, Mr. Forster said that it was his practice to seize from one-eighth to a quarter of an inch of the artery, and in the case of large vessels to twist it four or five times. Small arteries were usually more difficult to deal with than large, because the surrounding tissues were sometimes included in the grasp of the forceps.

A query from Mr. Croft elicited the opinion that it was of little consequence whether the vessels were cut obliquely or at right angles.

Mr. Bryant corroborated the experience of Mr. Forster in every particular; he had not used the ligature for two years. Mr. Poland had applied torsion to six femoral, two brachial, and a great many smaller arteries, with entire success. The speaker disagreed with Humphrey as to the mode of twisting, and believes that the external coat should not be twisted off, because it is required for the support of the middle and internal coats. The necessary number of twists must be judged of by the looseness of the external coat, and a jet of blood should be allowed to enter the artery at once to prove the success of the procedure.

Mr. Forster said that he wished to compare torsion with acupressure rather than with the ligature. There was little doubt, however, that all these plans were admirable, as immediate agents, but that we should look to the future. He averred that secondary hemorrhage sometimes ensued both after the application of the ligature and acupressure, but that in torsion it could not occur; that in the very last case on which he operated the only parts of the stump that did not slough were those around the artery, which latter was atheromatous and could not have been secured by ligature. He thought Mr. Croft's objection entirely untenable, and recommended Mr. Gascoven to live and learn.

Mr. Callender closed a very interesting discussion by remarking that, out of more than sixty capital operations performed at St. Bartholomew's Hospital during the current year, no case of secondary hemorrhage had occurred after the application of ligatures.—*Lancet*, Dec. 25, 1869.

39. *Arrest of Hemorrhage by Torsion of Arteries*.—An extremely interesting and instructive paper on this subject was read before the Surgical Society of Ireland January 7, 1870, by Mr. ROBERT McDONNELL. Dr. McD. stated that torsion has for a considerable time past been practised in Steevens' Hospital, and vessels such as supply large tumours were twisted with perfectly satisfactory results,

yet it was, of course, a gradual process by which Dr. Colles, Dr. Ed. Hamilton, and himself gained sufficient confidence in it to have recourse to it in cases of amputation; it has, however, now been used in not a few cases of amputation at the wrist, ankle, leg, immediately below the knee, and finally at the middle of the thigh. In these cases, the wounds have been closed without a single ligature being used; and in no case has secondary hemorrhage resulted.

The rapid recovery of the case of amputation of the thigh was very encouraging, and shows what we may reasonably hope to attain as regards the healing of wounds by the combined action of torsion and antiseptic dressing. As the details of the process of torsion, Dr. McD. says, differ considerably, according to the size of the vessel and the nature of the parts surrounding it, he gives the following description of the proceeding which he thinks best in each of several cases:—

1st. In order to secure a large-sized vessel, such as the femoral artery, by torsion, two pairs of forceps are required—such as these which I hold in my hand; these forceps correspond with the instruments used by Amussat for his “limited torsion;” but they may be effectively used in a manner different from that described by him. One of these pairs of forceps must be clasp-forceps, with blades broad enough to catch the entire mouth of the artery to be twisted. With these the mouth of the vessel is fairly caught (and the best proof that it is fairly caught is that no blood issues from either corner when pressure on the artery is relaxed); the clasp is then pushed home; the forceps are then gently pulled in the direction of the long axis of the vessel, which is thus drawn out a little way; unless, indeed, the structures around are unyielding from infiltration, when it may be necessary to free the vessel with the finger-nail from its most immediate connections. Having thus succeeded in fairly grasping the vessel across the mouth and drawing it out, the second pair of forceps come into play; this second pair consist of long narrow blades, by which the vessel is seized transversely and squeezed so tightly that the internal and middle coats are nipped across. In order more readily to effect this nipping across of the internal and middle coats, the blades of this second pair of forceps are made so that there is a depression on the inside of one of them, and a corresponding projecting ridge on the other. Having been forcibly squeezed home, so as to effect the division of the internal and middle coats, this instrument is withdrawn and set aside. Torsion is then performed by twisting round and round some five or six times the forceps which grasp the mouth of the vessel; the artery is twisted at that portion weakened by the nipping across of its internal and middle coats, and this has no tendency to untwist. The forceps by which the vessel is seized transversely do to the artery exactly what a well-applied ligature does—viz., they divide the internal and middle coats evenly, smoothly, and completely; and, in order to act well, the blades must be neither too blunt nor yet too sharp, and in squeezing them home the surgeon should feel the coats give way, as in the drawing home of a ligature. It is not either desirable or necessary to twist off the end of the vessel.

2d. In order to secure by torsion such arteries as the radial, ulnar, anterior tibial, &c., the forceps known as Mr. Syme’s torsion forceps generally answer admirably, without the aid of any others. These forceps have two teeth, or prongs, on one side, and three on the other, and are wide enough to clasp the entire of the mouth of the artery; many of these forceps are made with the prongs too long, so that when the twisting begins they entangle the surrounding textures, and drag them into the vortex. The ordinary artery forceps, provided with one tooth on one side and two on the other, is an utterly useless instrument; it is not as good as a simple tenaculum for drawing out a vessel, and is worse than useless for torsion, as it only succeeds in biting a piece out of the mouth of the vessel, and, of course, leaves it bleeding more furiously than ever. If a vessel, such as the radial, is not effectually secured by a few twists of Syme’s torsion forceps, it should be grasped again fairly, and the forefinger and the thumb of the left hand passed down over the end of the forceps so as to catch the end of the vessel under the thumb-nail, and at once give it a pinch and fix it while the forceps are twisted; thus the fingers effect what Amussat accomplished by forceps in his “limited” torsion.

3d. In order to secure small arterial twigs surrounded by lax areolar tissue—as every one knows very moderate-sized arterial twigs sometimes give rise to hemorrhage, most embarrassing to the surgeon—the precise means of controlling by torsion the bleeding from such vessels depends very much on the tissue by which the artery is surrounded; such arteries as the spermatic, or those divided in amputation of the fingers and toes, may in general be managed by Syme's torsion forceps with as much facility as those of larger size; but where the arterioles are surrounded by a great abundance of lax areolar tissue the case is otherwise. If a small vessel in the scrotum, upper eyelid, or prepuce, is caught in Syme's torsion forceps, as soon as the twisting begins a great quantity of the loose tissue around is drawn into it as into a whirlpool; it is like the screw on the wash-rod of a gun when screwed into a mass of tow. The twisting cannot be properly effected by such forceps; and even when they are disentangled, the elastic tissue untwists, and the vessel bleeds away. The same happens in the case of small arteries in the loose areolar tissue surrounding tumours such as are readily turned out of their bed by the finger or the handle of the knife. In this case it is best to catch up the orifice of the vessel neatly with the tenaculum, or small hook; draw it out from its cellular bed, then seize it in a pair of forceps like those used for catching the conjunctiva in order to fix the eyeball. The teeth of such forceps are not so sharp or pronglike as those of Syme's, and in twisting do not screw into the surrounding tissue, and, unlike the common clasp-forceps, they are able to catch the little vessel immediately above the spot where the point of the tenaculum penetrates.

I removed, not long since, in Steevens' Hospital, a large fibrous tumour from below the crest of the ilium. It was superficial to the fascia over the gluteal muscles, and was very readily turned out by the finger from the cellular bed in which it lay; a large number of small arteries bled wickedly; some of these might be seen for an inch or more of their length, and there was no difficulty whatever in seizing them; yet when twisted with Syme's forceps many of them untwisted again, and bled as before. In such a case the twisting is, I presume, as I may say, spread over a long piece of the vessels; its inner and middle coats are not broken at any point, and the elasticity consequent on this causes the little vessel to unscrew itself just as an India-rubber tube would. It becomes, therefore, in this case again necessary to fix the upper part of the vessel with the forefinger and thumb, and having pinched the little vessel with the nail to effect the "limited" torsion of Amussat.

4th. To secure by torsion arteries imbedded in muscular tissue.—When a muscle is cut transversely, or nearly so, as in an amputation, the arteries emanating from it are usually easily caught and secured by twisting with Syme's forceps; often the mouth of the vessel projects in a little nipple-like prominence, and the direction of the long axis of the vessel is obvious, so that no mistake is likely to be made as to the lie of the artery. Where a tumour, however, is removed, and with it some portion of an underlying muscle, it is often by no means easy to detect or surmise the exact course of an artery seen bleeding from the surface of the muscle.

A tumour of the breast, suppose, is removed, and with it some fibres of the great pectoral; a bleeding point is seized in Syme's forceps and twisted. It is not possible to be certain how exactly this vessel runs within the muscular structure, which is friable, and, in fact, torn by a few twists, so that a little pit is left bleeding from the bottom. These are very troublesome vessels to secure; and here, again, I believe the best plan to be, to draw them out with tenaculum and twist with forceps, more toothed and less pronged than Syme's.

Vessels very close to the integument are sometimes troublesome to twist, as it is not possible to catch them without taking hold of the skin at the same time; such vessels at times give rise to troublesome hemorrhage; it is well, however, to secure them by passing a suture close to them.

Of the pathological conditions which modify the applicability of torsion.—There are tumours, the vessels of which partake so much of their soft structure, that when ligatures are applied to them these cut their way through and come away as if the silk had been drawn home through a piece of dough or putty. Such vessels cannot be twisted; but neither can they be secured by a

ligature. Suppose that a tumour of this nature is lodged in the parotid region: the surgeon hopes to be able to dislodge it entirely, but finds that it is wedged in more deeply than he anticipated; he is obliged to cut off a part and leave a part behind; the vessels of the portion remaining bleed profusely, and being imbedded in the soft tissue of the tumour, having delicate walls, and in fact little or no cellular coat, they cannot be secured by torsion, and ligatures cut their way through. Strong ligatures passed through the base, or tied around it very firmly, alone can prevent hemorrhage. Even the slow use of the *écraseur* does not prevent bleeding in such cases.

It is a question to be determined by further experience, how far age and any tendency to an atheromatous state of the arteries may forbid the use of the torsion. It may turn out that torsion is even more secure than ligature in atheromatous arteries. When secondary hemorrhage has followed the application of the ligature in such cases, the artery is found trumpet-mouthed; the internal coat, having become altered and tough by disease, is not cut through by the ligature, and the outer coat, which is free from disease, is, in fact, not called into fair play to take its important share in the process. Torsion would probably call more completely into action that coat of the vessel which is in this peculiar condition most free from disease.

There is no doubt that arteries imbedded in structures more or less infiltrated or diseased, are apt to twist off readily, and still continue bleeding; and it is then sometimes difficult to get the vessel so as to apply a ligature. In situations where it is not an easy matter to follow the vessel up a little way, if necessary, it may be undesirable on this account to twist at all. For instance, in amputation of the leg, if a piece should be twisted off the inter-osseous, and it continues to bleed, it may be by no means easy to take it up, and secure it by a ligature. Such vessels are not among the most favourable for torsion; yet, admitting that it is not applicable in all cases, I cannot help believing that it is in the majority of instances the best means at present known of arresting hemorrhage with a view to speedy recovery; and I trust that the experience which we have had of it in Steevens' Hospital may recommend it to the members of this Society and the profession throughout Ireland.—*Medical Press and Circular*, January 26, 1870.

40. *Galvano-caustic Method of Removing Tumours in the Larynx*.—Dr. REICHEL, of Breslau, communicates the results of his experience in reference to this mode of treatment, which he states has proved of the greatest service in his hands. It is available for all sorts of tumours, even when they are multiple or have a very broad base, and there is no danger of subsequent loss of voice. A good battery and a skilful operator are, however, indispensable. The instruments required are few, simple, and delicate, the chief being a cutting-loop of wire and an extremely fine galvano-cautery, thus contrasting favourably with the knife, scissors, and crushing instruments demanded for other methods. The pain suffered by the patient is very small, scarcely amounting to more than a sensation of heat. The action may be rendered very limited indeed. The time required for the operation is also very small. The instrument is introduced whilst cold, and as soon as the cautery is in contact with the surface, or the tumour is inclosed in the wire-loop, these can be brought to a white heat, and as instantaneously cooled. There is no hemorrhage, and no disagreeable after-effects have been observed. Unless the growths are of a malignant nature no recurrence takes place. On the whole, he coincides with Türk that for the treatment of tumours of the larynx the galvano-caustic method is indispensable, and constitutes one of the greatest triumphs of modern surgery.—*Practitioner*, March, 1870, from *Berliner Klinische Wochenschrift*, No. 51, 1869.

41. *Compound Fracture of Patella; with an Analysis of fifty-six Cases of that Injury*.—This is the title of a paper read before the Royal Med. and Chirurg. Society Jan 11th, 1870.

The author, in presenting the case to the notice of the Society, drew attention to the following facts: 1. The peculiar and unusual nature of the

accident; 2. The attempt to save the limb under circumstances most disadvantageous, owing to physical and moral defects; 3. The unfortunate relapse and threatening symptoms of pyæmia, after the primary danger of an inflamed and suppurating joint had passed over; 4. The chest-complication and exhaustion of the patient after subsidence of the pyæmic symptoms; 5. The saving of life by amputation of the limb. G. M., aged 28, a boiler-maker, was admitted into Guy's Hospital on January 19th, 1869. About eight weeks previously, a transverse lacerated wound over the right knee was produced by a fall; for this he was treated as an out-patient at the hospital. The wound was about three and a half inches in extent, and the patella was exposed; but the joint was not injured. Strapping, and a back splint between the knees were applied. Cicatrization was almost completed; and he removed the splint and went about his employment. Early on the morning of his admission, he caught his foot in a grating, and was thrown down on his side, in his fall using great muscular exertion to save himself. The newly cicatrized wound was torn open, and he suffered great pain. He was immediately brought to the hospital. There was a large gaping wound in the site of the original injury; also a transverse fracture of the patella. There was hemorrhage, and escape of synovial fluid from the joint. The dresser on duty introduced his finger into the joint. The wound was closed by sutures, a compress of lint with strapping applied, and a back splint adjusted behind the knee. When he came under Mr. Poland's notice, he was suffering from a chronic cough and general debility, which gave rise to the suspicion of phthisis, although no evidence could be elicited by the stethoscope. In three or four days, inflammation and swelling of the joint ensued. The dressings and sutures were removed, and carbolic acid lotion was applied to the wound, which had a sanious discharge. On the tenth day, suppuration had fully set in, and the discharge was profuse. This suddenly lessened, and symptoms of pyæmia became manifest; but suppurative action in and about the joint reappeared, necessitating the use of free incisions. During a lingering and tedious suppuration, with ulcerative action for a period of six weeks, the man's health began to give way. Amputation was performed on the 5th of March. The patient made a most rapid recovery, and gained flesh, although he did not lose his cough entirely. The author made some comments on the peculiar nature of the injury, and referred to other cases of compound fracture of the patella. The patient's extremely exhausted condition and general state of health negatived the performance of excision; and, the more so, as the integuments and soft parts above and below the joint were much implicated in the suppurative action. The author also adverted to the statistics of fifty-six cases of compound fracture of the patella without any complication of the neighbouring bones of the joint. Mr. Poland concluded by inquiring whether there could be a compound fracture on the patella without a wound or lesion of the knee-joint? He had made some experiments which led him to believe that there could.—*Brit. Med. Journ.*, Jan. 22, 1870.

42. *Amputation at the Knee-joint.*—MR. GEO. D. POLLOCK, in a paper read before the Royal Med. and Chirurg. Soc. December 14, 1869, commenced by drawing attention to the circumstance that amputation at the knee-joint had not been very favourably entertained until within the last thirty years, and that only very lately had it been much advocated. Having himself performed the operation in several cases with satisfactory results, he desired to bring his experience before the Society.

After referring to the practice of Mr. Syme and of Mr. Samuel Lane, the author proceeded to say that, in the consideration of amputation through the joint, two conditions must be borne in mind—first, if there be disease of the joint and ulceration of the cartilages after the leg is taken off, the articular surfaces of the condyles and patella should be removed; secondly, if no disease of the joint exist, but amputation be requisite on some other account, then the articular cartilage should be left intact.

The author related the particulars and results of eight cases in his own practice, and quoted communications received from other English surgeons. From various sources he had been able to collect 48 cases operated upon in England.

These showed a gross result of 36 recoveries, and 12 deaths. A collection of American cases showed 32 recoveries and 13 deaths—thus giving a total mortality of 26.88 per cent.

After some further account of American experience in the matter, the author proceeded to describe the improvement suggested by Mr. Carden, of Worcester, of making the flap of skin taken from the front of the leg. He himself approved of the suggestion. The anterior flap should be long enough and broad enough to cover the whole of the exposed end of the femur. It should be so broad at its base as to be at least two-thirds of the circumference of the joint, the posterior flap at its base forming the other third. The author lays stress upon the anterior flap being of sufficient length (at least five inches below the lowest point of the patella), and is inclined to leave the patella in the flap when the joint is healthy. When it is diseased, he recommends the removal of the articular surface alone. The comparison between the stump usually obtained after amputation through the thigh, and that obtained after amputation through the knee-joint, is very much in favour of the latter, which is never conical or retracted, and is superior in strength and fitness for locomotion, in comfort and freedom from pain, and in capability to bear weight and endure exertion. It is also more easy to adapt a good serviceable artificial leg to such a stump. In conclusion, the author thought the facts he had brought forward, although not enough to lead to positive conclusions, were enough to commend the operation to the favourable consideration of the Society.—*Lancet*, Dec. 25th, 1869.

43. *Thyroid Dislocation of the Hip-Joint*.—As the opportunities for the dissection of cases of recent dislocation of the hip-joint are not frequent, Mr. THOMAS ANNANDALE, Surgeon to the Edinburgh Royal Infirmary, has thought it interesting to place upon record the following case, the more particularly, he says, as it proves in his opinion “the correctness of the views lately published by Professor Bigelow (*The Mechanism of Dislocation and Fracture of the Hip*). This case is the fifth recent dislocation of the hip-joint which I have reduced by manipulation. Two of these were thyroid dislocations; one was a dislocation on to the dorsum of the ilium; one into the sciatic notch, and one on to the pubes. The experience of these cases, and a study of the one related, have convinced me of the importance of the Y ligament as an agent in preventing, under certain conditions, and assisting under others, the reduction of dislocations of the hip-joint. I therefore cordially add this testimony to the value of Professor Bigelow’s observations.”

CASE.—“The patient was a strong healthy man, 19 years of age, who was admitted into my wards in the Royal Infirmary, on account of a serious railway injury, in December, 1869. His injuries consisted of a comminuted fracture of the right humerus, a compound fracture of the right leg, a compound comminuted fracture of the left forearm and hand, and a dislocation of the head of the left femur into the thyroid foramen. The symptoms of the dislocation were well marked, and consisted of slight flexion of the thigh and abduction of the whole limb, which was fixed in this position. The patient was too weak to admit of the removal of the injured limbs; so we contented ourselves with administering stimulants, and applying heat to the surface of the body. Under this treatment, his pulse rose a little; and, having given him one or two inhalations of chloroform, I reduced the dislocation of the hip by manipulation with great ease.

“The patient gradually sank, and died about two hours after admission. An examination of the injured joint about fourteen hours after death showed the following condition. There were slight extravasations of blood among the muscles on the anterior, outer, and posterior aspects of the joint; and extravasation of blood and severe bruising and laceration of the muscles on the inner aspect of the joint, more particularly of the fibres of the obturator internus, portions of which had been forced into the acetabulum. The tendon of this muscle was not ruptured. The head of the femur lay in the acetabulum, and the capsular ligament was extensively torn on its inner and lower aspects. The round ligament was completely torn away from the head of the femur, and at-

tached to it was a thin layer of articular cartilage and some small particles of bone. The anterior, and a greater part of the posterior portion of the capsular ligament were entire; and a careful dissection of them showed, most distinctly, Professor Bigelow's Y ligament uninjured."—*Brit. Med. Journ.*, Jan. 29, 1870.

44. *Strangulated Inguinal Hernia; Gangrene; Sloughing of a portion of Small Intestine; Restoration of Continuity of Intestinal Canal.*—MR. PAGET in a recent clinical lecture referred to the case of a woman, who, at an advanced period of pregnancy, had become the subject of an acute strangulated inguinal hernia of large size. The gut rapidly became gangrenous, and was therefore not returned at the operation; and about fourteen days afterwards, a piece of small intestine, eight inches long, came away by the wound. She began to pass fecal matter *per rectum* about three weeks after the operation, and, at the present time, very little fecal material passes from the wound, showing that the continuity of the intestinal canal has been completely restored. She aborted soon after the operation. Mr. Paget considered that this case well illustrated the importance of disturbing the intestine as little as possible at the seat of constriction in cases where the strangulated portion is gangrenous; and gave as the rule for practice, that the constriction should be just sufficiently divided to enable the finger to pass into the intestinal canal above the seat of stricture, in both directions from an opening made in the strangulated portion, so as to make sure that feces will pass freely from the wound.—*Brit. Med. Journ.*, January 29, 1870.

45. *Some points relating to the Treatment of Strangulated Hernia.*—M. TILLAUX approves of Prof. Gosselin's decided practice in relation to strangulated hernia, viz., after performing the taxis first without and then with chloroform, without success, to immediately resort to the operation. He especially opposes Malgaigne's theory, which, by attributing so much importance to inflammation, leads to a dangerous temporization in endeavouring to treat this. Still, M. Tillaux cannot consent to entirely overlook the old theory of obstruction or the modern one of inflammation, having so often observed, at the Bicêtre, large and old hernias partly or wholly irreducible, which had become the subjects of this obstruction, inflammation, or slight strangulation, whichever it may be, insensibly yielding to the effects of rest and cataplasms. Still, for recent hernias of moderate size and usually reducible, which have become strangulated, M. Gosselin's rule is the proper one.

The taxis, when it succeeds, acts as if by enchantment in the relief of symptoms; but numerous questions arise in its application, such as whether it should be moderate or forcible, how long it should be continued, and at what stage of the strangulation it ceases to be practicable. Thus, while M. Gosselin employs all the force that can be excited by two, four, or even six hands, most surgeons think a more moderate procedure preferable; and few would carry their enthusiasm for it so far as M. Thiry, of Brussels, who perseveres with it for twelve or fifteen successive hours. M. Tillaux is of opinion that when it has been properly applied for a quarter of an hour upon a patient in a state of anæsthesia, and does not succeed, the operation should be resorted to. The surgeon is not in possession of any positive sign that the taxis will prove harmless, and M. Tillaux cites a recent case in proof of this. In a patient who presented an inguinal hernia of twenty-four hours' duration, with the skin tense over it, and sound in appearance, and unaccompanied by any sign of local reaction, he performed a moderate taxis for a few minutes, the hernia being reduced. Two hours after, the patient died in intense pain, and the autopsy revealed intestinal perforation. How little the mere duration of the strangulation can provide a rule may be seen from another case, in which a femoral hernia had been strangulated for eight days, and yet the intestine was found perfectly healthy.

After adverting to the ordinary rules for the operation, according to the condition in which the intestine is found, M. Tillaux adverts to the rarer case in which the lesion of the intestine is limited to its serous membrane. In a femoral hernia, in which strangulation had continued sixteen hours, he found the

peritoneum detached from the intestine to about the extent of four square centimetres, just as the epidermis is in a burn. As the muscular coat appeared healthy, he returned the intestine, and the patient recovered after some slight symptoms of localized peritonitis.

Besides the ordinary mode of strangulation by the rings and the orifices of the cribriform fascia, M. Chassaignac has pointed out one due to the inflexion of a noose of the intestine over a sharp edge, as, for example, Gimbernat's ligament. In this case the taxis only increases the inflexion of the hernia, instead of reducing it, all pressure acting, in fact, directly on the hernia. In a case here selected, in which the taxis had been freely employed prior to admission, the noose of intestine, lying with its convexity inwards, was strangulated by the external edge of Gimbernat's ligament. It was healthy, and having been straightened in order to be returned, it spontaneously reentered the abdomen without any pressure whatever having been exerted upon it. The patient died of peritonitis.

M. Tillaux protests against the adoption of the practice recently advocated by M. Girard of performing the operation, and leaving the hernia unreduced, under the idea that the reduction of the inflamed intestine is the cause of the peritonitis that so often ensues. M. Girard bases his recommendation chiefly on two cases, in which, owing to gangrene in adhesions, reduction had not taken place, and yet the patient recovered. This, M. Tillaux observes, is the old story of their recovery, in spite of, and not in consequence of, non-reduction; and he cannot treat the proposal as serious until cases have been treated by intentional non-reduction. He observes the return of the intestine is not the source of danger in herniotomy, but the peritoneal wound; and he believes that ovariectomy may teach us one reason why operations for hernia are so fatal. In it the surgeon, above all things, is assiduous in preventing the sojourn of a drop of blood or other fluid in the cavity of the peritoneum, for it is from the subsequent decomposition of this that peritonitis is to be feared. In hernia it is obvious that the blood from the bleeding surfaces easily may gain access to the cavity. This is a mere hypothesis, but it is desirable that the attention of surgeons should be turned in this direction.—*Brit. and For. Med. Chir. Rev.*, Jan. 1870, from *Bull. de Thérap.*, June 30, 1869.

46. *Subcutaneous Evacuation of the Matter of Buboec.*—In the *Wiener Med. Presse* for 1869, Dr. GRUNFELD suggests the removal of the purulent contents of buboec subcutaneously, by means of an explorative trocar with an accurately fitting syringe adapted to take up upon the withdrawal of the piston about 1 to 2 drachms of fluid. Dr. TOMOWITZ has practised this operation. He describes it as one quickly performed and without pain, and leaving no permanent cicatrix. (In twenty-seven of Dr. T.'s cases the cure, in twelve, took place within 10 to 20 days, in eight, within from 1 to 10 days, etc.) The operation excites no disposition to the occurrence of hospital gangrene. When the contents of the bubo are of too thick a consistence to pass readily through the canula attached to the syringe, we must wait until, by proper applications, supuration is promoted and the walls of the abscess become thinner. The puncture of the bubo should be repeated every two or three days until pus ceases to be secreted into the cavity of the abscess. It is not advisable, however, to remove entirely all the contents of the latter. Its permanent obliteration does not require it. An unfavourable result need be feared only in cases where there is an evident tendency to a thinning of the skin over the tumour, and an apparent spread of the disease, as shown by the morbid enlargement of the lymphatic glands about the base of the tumour.—*Centralblatt f. d. Med. Wissenschaften*, Dec. 23, 1869, from *Wiener Med. Presse*, 1869, S. 944. D. F. C.

47. *A Plate with Artificial Teeth Swallowed, Detected in the Stomach, and removed.*—Mr. L. S. LITTLE read before the Royal Med. and Chirurg. Society a report of a case of this. A woman was admitted into the London Hospital, who, two days previously, during an epileptic fit, had swallowed a gold plate, to which some artificial teeth were attached. This produced so much irritation that no food had since been retained; and as the foreign body could readily be

felt in the stomach by means of an ivory-tipped probang, Mr. Little passed an ordinary œsophageal coin-catcher, and, after several attempts, succeeded in hooking the plate, and drawing it up as far as the pharynx, where it lodged. Considerable difficulty was experienced in removing it from this situation, although this was ultimately effected, and the patient recovered without a bad symptom. The plate, which had sharp projecting extremities, measured one inch and three-quarters in length, by one inch and a quarter in width, and fixed to it were three incisor teeth, one canine, and one bicuspid. The author advocated attempts at extraction in similar cases, urging that if a foreign body has passed down the œsophagus, and through the cardiac orifices of the stomach, no great difficulty will be met with in its withdrawal through the same passage, provided no force be used; and he referred to some experiments by Mr. Pollock, to show that the removal from the stomach of even a small plate by the natural efforts is very improbable.—*Lancet*, Feb. 19th, 1870.

OPHTHALMOLOGY.

48. *Periodical Changes in the Diameter of the Pupil, without Modification of Refraction or Accommodation.*—The following interesting case of this is related by Professor DONDERS. J. K., a lad aged 18, had suffered for some weeks from an exanthem on the right half of the face, and a kind of boil beneath the nose. While being treated for this affection, the patient's vision became obscure, and mydriasis appeared, first in the left and then in the right eye; and in a few days an extraordinary inconstancy in the diameter of the pupils was observed. At first, the process ran its course regularly every twenty-four hours; at half-past seven in the morning the pupil was dilated nearly to its maximum, in a moderate light, and towards noon was reduced nearly to the size of a pin's head; so that extreme degrees both of myosis and of mydriasis were successively developed during the day. This was the account given to Dr. Donders by the patient and by his brother who accompanied him. They added that for some days the changes had been less regular, and were much less marked. Dr. Donders ascertained that, within sixteen hours, the broad diameter of the pupil became frequently twice as great as the narrow. There was absolutely no disturbance of vision to be observed; the patient was obliged to look into a mirror in order to learn the state of his pupils. The ophthalmoscope showed only strong capillary injection of the optic disk, which, indeed, is not rare as a normal state in the young. The pupils had, both in the contracted and in the dilated state, a relatively similar mobility, acting directly and together under the influence of direct light, and in accommodation to near objects. The left pupil was generally somewhat larger than the right, sometimes *vice versâ*; in both cases the difference was greater in moderate than in strong direct light, and greater also in accommodation to distant than to near objects. While the sphincter of the pupil thus seemed to act in all respects normally, no disturbance of function could be detected in the course of the third nerve; nor could there be said to be any disturbed innervation of the parts supplied by the fifth nerve. By exclusion, then, the source of the condition described had to be sought in the sympathetic; it might be assumed that in dilatation the sympathetic branch which acts on the radiating fibres of the iris was stimulated; while in contraction its action was diminished. The question now arose, whether the difference in the action of the radiating fibres had an influence either on refraction or on accommodation. A careful examination showed that, whatever the diameter of the pupil was, both refraction and accommodation remained unaltered. The patient could read for a considerable time without fatigue, with glasses of $-\frac{3}{4}$. The colour and temperature of the face and ears—which were noticed with reference to the vaso-motor function of the sympathetic—underwent little change; almost none whatever in connection with the

changes in the diameter of the pupil. There was no evidence of the presence of intestinal worms.—*Brit. Med. Journ.*, Jan. 1, 1870, from *Nederlandsch Archief voor Genees-en Natuurkunde*, Deel iv., 5e Aflever. 1869.

49. *Endemic Hemeralopia*.—M. GALEZOWSKI having been consulted concerning several cases of hemeralopia which had occurred in the 64th Regiment of the line, and believing, as the result of ophthalmoscopic examination, that a spasmodic contraction of the arteries of the retina constituted the first stage of the pathological process, he determined to try the effect of the calabar bean, and prescribed a collyrium containing two centigrammes of eserine to ten grammes of water, dropping four drops one or more times in the eye daily. This effected a cure more rapidly than any other means in several cases in which it was tried. Upon the subject of hemeralopia in general, M. Galezowski's investigations have led him to these conclusions—1. Endemic hemeralopia is an affection of the nervous membrane, characterized by a spasmodic contraction of the arteries of the retina and its consecutive anæsthesia. In certain forms of the disease there are found grayish-white serous infiltrations, especially at the circumference of the papilla, as has been demonstrated by MM. Quaglino and Martialis, and as I have verified during this year on some of my patients. 2. This affection is generally endemic, and is observed in countries and localities where marsh fevers exert their ravages. It is also very often met with among sailors and soldiers who bivouac in humid localities. 3. Endemic hemeralopia is usually cured speedily, but it leaves a disposition to relapse in spring and autumn. M. Perreon, surgeon of the 64th Regiment, has found the same soldiers seized with hemeralopia during several successive springs. 4. The hemeralopia attacks both eyes at once, and in the same degree. 5. This form of amblyopia may be simulated by soldiers, and detection may be attended with considerable difficulty, when ophthalmoscopic phenomena are absent, as happens sometimes. Shutting them up in a completely dark room for a day or two easily induces them to abandon the attempt at deception. They become wearied out, and declare that they are cured. 6. The internal use of cod-liver oil, and fumigation by the vapours of the livers of animals directed on to the eye, have no efficacy whatever in the disease. More success is obtained from the use of purgatives and emetics, as the affection is often connected with gastric disturbance. 7. The hemeralopia which accompanies congenital or syphilitic pigmentary retinitis is permanent, while this form is transitory. The one progressively leads to complete blindness, while the other is usually followed by recovery.—*Brit. and For. Med. Chir. Rev.*, Jan. 1870, from *Gaz. des Hôpitaux*, Oct. 23d, 1869.

50. *Influence of the Nerves in affecting Changes in the Diameter of Pupil*.—The question in what mode the two motor nerves of the iris—the oculo-motor and the sympathetic—act in effecting changes in the diameter of the pupil has recently been the subject of much careful investigation. Histologists, physiologists, and ophthalmologists have alike been interested in its solution; and conclusions differing considerably from each other have resulted from the subject having been examined in different modes and regarded from various points of view. There can be no doubt of the existence of a muscle in the substance of the iris, composed of circularly arranged fibres, usually of the unstriated variety, surrounding the pupil concentrically. By most authors, as Kölliker, Henle, Brücke, and others, the presence of a second set is admitted, occupying a place somewhat posterior to the former, and arranged in a radiating manner near the periphery of the iris. This also, in man and many other animals, consists of unstriated muscle; but in birds both sets are striated, and subject in their action to the will of the animal. A discrepancy of opinion, however, exists respecting the latter set; Grünhagen, an able microscopist, denying, on microscopic and micro-chemical grounds, that any such radiating fibres can be demonstrated in man, mammals generally, or in frogs, and maintaining that the fibres described by Henle are artificial products; he admits a sphincter, but not a dilator of the pupil. In this state of the question a fresh observer appears in the field, M. Engelhardt, who, without pursuing the anatomical

mode of investigation into detail, believes that the facts of the case may be ascertained by the method of experiment, the exciting agent being electricity. This method had already been adopted by Bernstein, and Dr. Engelhardt appears to coincide essentially with the facts arrived at by this investigator. Bernstein found that, on applying the poles of an electric battery to the opposite sides of the cornea of an eye recently removed from the body of a rabbit, dilatation of the pupil was immediately observed. By an analogous experiment, in which four electrodes were applied to the surface of the iris, contraction of the sphincter iridis could be effected, the electric stimulus acting of course, in each instance, in the direction of the length of the fibres called into action, and perpendicularly to the opposite set. And these experiments have been repeated and confirmed by Engelhardt, who adds this further proof of the existence of a dilatator pupillæ: If intense myosis be effected by the instillation of Calabar bean into one eye, irritation of the central extremity of the divided sympathetic in the neck produces no effect, for the sympathetic is paralyzed by the bean; but if a current of electricity be passed across the eye, the electrodes being placed on opposite sides of the cornea, immediate dilatation can be induced, the muscular fibres being then directly called into action. A similar proof of the existence of a dilatator was formerly furnished by Hirschmann, after the pupil had been made to contract with nicotin.

We may just add, in passing, that a paper has appeared in the last number of Schultze's Archives, by M. Dogiel, in which he states he has demonstrated, microscopically, the presence of both a dilatator and a sphincter in a considerable number of animals with the greatest certainty. These being admitted, then, the next point is to determine in what way the movements of the iris are influenced by the third nerve and the sympathetic respectively. To determine this, it seemed to be of great importance to discover how the iris behaves when both sets of fibres are either directly, or indirectly through these nerves, stimulated to the utmost extent; and this may be effected either by the application of two oppositely-charged electrodes to the fibres, or by acting on one set of the fibres with one electrode and the nerve supplying the opposite set of fibres with the other electrode, or by stimulating both nerves coincidently. When both sets of fibres were directly stimulated, the pupil retained its average diameter and circular form, or occasionally became elliptical. When one set of muscles was directly stimulated, and the other excited through the nerves, no remarkable preponderance of one over the other set was observed; but when both nerves were simultaneously excited, the action of the third was decidedly strongest, strong contraction of the pupil resulting, and it was noticed that the action of the stimulus, when applied through the nerves, was in all instances much greater than when applied directly.

In reference to the action of atropia and of Calabar bean, opinions are as much divided as on the musculature of the iris: some thinking that atropia paralyzes the third, and Calabar bean paralyzes the sympathetic (Bernstein, Dogiel, Rosenthal); others, that whilst atropia paralyzes the third it also excites the sympathetic (De Ruiten), and that Calabar bean, whilst it paralyzes the sympathetic, excites the third nerve, or may even have no action on the sympathetic, and simply stimulates the third (Von Graefe, Robertson, Grünhagen, Rogow). From Engelhardt's own experiments, in which, after the employment of atropia, electricity was used as a stimulus, he has arrived at the conclusion that atropia does not paralyze the fibres of the sphincter, but diminishes their excitability through its paralyzing agency on the third nerve. The action of Calabar bean from similar experiments he considers to be stimulating on the extremities of the third nerve. He is further disposed to admit the presence of a ganglionic system of nerves imbedded in the substance of the iris, situated between the radiating and concentric fibres, which acts as an inhibitory centre upon the sympathetic.—*Lancet*, Jan. 22, 1870.

MIDWIFERY.

51. *Complex Presentation.*—Dr. WM. ALEXANDER records (*Glasgow Med. Journ.*, Feb. 1870) the following very rare case of this: Mrs. R., in the beginning of the seventh month of her tenth pregnancy, awoke on the morning of the 23d of July, as she said, "swimming in water," and then sent for me. She had no labour pains, but it was evident that the membranes had given way, and a sufficiency of water had escaped, not only to soak the bed, but to pass through it and wet the floor. The os was patent enough to admit a finger easily, but no presentation could be felt. Rest was enjoined, and an opiate given.

Mrs. R. kept her bed till the 1st of September, when illness in the family required her to get up occasionally and undergo some fatigue. Slight labour pains came on, for the first time, on the morning of the 5th of September, and as they were getting more severe after midday, I was sent for at half-past three o'clock. On arriving, and making an examination, I found, first, a hand, and then the head, low down in the pelvis, during the pain which was then upon her. On the pain ceasing, a further examination detected another hand on the opposite side of the head, and two feet pressing against the forehead in the hollow of the sacrum. I then began to think I had got a twin case to deal with; that the head and hands of one child were coming down, and the feet of the other. While thus in a state of suspense, another powerful pain came on, during which I found the presenting parts advancing towards the birth, retaining their relative positions. A third pain put the perineum upon the stretch, and two more sufficed to deliver a living child at four o'clock, with a hand on each side of the head, and the feet pressing against the face of the child, the breech being, of course, the last part expelled.

52. *Complication of Pregnancy with Ovarian Disease.*—Dr. SPENCER WELLS read to the Obstetrical Society of London (Dec. 1, 1869) a paper on this subject. The author related fifteen cases of pregnancy complicated with ovarian disease, which had fallen under his own observation. In three cases, sudden death followed spontaneous rupture of the cyst, in or before the seventh month of pregnancy. In two cases pregnancy and ovarian disease went on together without interference, and lingering labours ended in the birth of stillborn children. In one case, twins were born alive; but the mother had suffered greatly from distension. In one case five, and in another six pregnancies had gone on, and ended normally without interference, but in the last case, the cyst ruptured spontaneously in the seventh pregnancy. Five patients were tapped during pregnancy; one, twice; one, three times; and three, one each. In all, five living children were born after natural labours. In one of them, ovariectomy was successfully performed, four months after delivery. In one case, ovariectomy was performed in the fifth month of pregnancy, the uterus was emptied at the same time, and the patient recovered. In the concluding case of the series, ovariectomy was performed in the fourth month of pregnancy, after spontaneous rupture of the cyst, and peritonitis, pregnancy proceeding without interruption. The author believed that a careful consideration of these cases would lead to the following conclusions: 1. Pregnancy and ovarian disease might go on together, and end safely both to mother and child. 2. But, in a large proportion of cases, probably in nearly all where the ovarian tumour was large, there was danger of abortion; or, if pregnancy proceeded to the full term, of lingering labour, and a stillborn child; and throughout the later months of pregnancy there was danger of sudden death to the mother, from rupture of the cyst, or rotation of its pedicle. 3. Spontaneous premature labour might not save the mother from these perils; and the induction of premature labour almost implied sacrifice of the child, with considerable risk to the mother. 4. There was no proof that tapping an ovarian cyst was more dangerous during pregnancy than at any other time. It would generally afford immediate relief to distension, and lead to the normal termination of pregnancy in the birth of a living child, at a very slight risk to the mother, if proper precautions were taken to prevent the escape of ovarian fluid into the peritoneal cavity, and the entrance of air into

this cavity and into the cavity of the cyst. 5. If an ovarian cyst should burst during pregnancy, removal of the cyst, and complete cleansing of the peritoneal cavity, might save the life of the mother, and pregnancy might go on to the full term. 6. Of three cases on record where a pregnant uterus had been punctured during ovariectomy, the only recovery was in the one case where the uterus was emptied before the complication of the operation.—*British Medical Journal*, December 18, 1869.

53. *Puerperal Fever*.—DR. WYNN WILLIAMS read a paper before the Harveian Society Jan. 20th, 1870, on this disease. He considered that this affection might be divided into two classes: the one depending on simple inflammation, the other on specific poison. The same tissues of the body may be attacked in either case; in the one, usually confined to one organ; in the other, almost general from the commencement. He considered the poison to be always due to the presence of putrid animal matter, and of course septic, in no way different from the septic poison, when seen in the male, or non-parturient female; that it might be produced at any time, by introducing the products of animal decomposition under the skin of the parturient or non-parturient; and that the only difference is in the peculiar condition of the parturient female. He did not agree with those writers who believed it might be caused by the exposure of the lying-in woman to the peculiar poison of scarlatina, smallpox, typhus fever, erysipelas, &c. The post-mortem appearances differ in no essential form from those found in the bodies of those who have died from pyæmia after surgical operations. If the obstetrician has been attending a case of puerperal septicæmia, or indeed septicæmia occurring in any one else, he should place himself in a small room or closet, and place some scales of iodine over a spirit-lamp, and allow himself to be surrounded by its fumes.—*Lancet*, Feb. 12th, 1870.

54. *Injection of Ammonia into the Veins for Puerperal Fever*.—DR. TYLER SMITH read before the Obstetrical Society of London (Dec. 1, 1869) a paper on a case of puerperal fever treated by injection of ammonia into the veins, followed by recovery. The patient, a primipara, was delivered by forceps on Nov. 1st. On the 5th symptoms of puerperal fever supervened, and on the 12th she was in such imminent danger that Dr. Smith determined to try the injection of ammonia into the veins, as practised by Dr. Halford in Australia for snakebite. The operation was performed at 7.45 P. M. A solution of one part of liq. ammoniæ to three parts of water was injected to the extent of half a drachm into one of the veins of the right forearm. As soon as two or three drops had been injected she roused, and complained of severe pain in the opposite arm. When the operation was completed there was very great pain over the whole body, with intense smarting of the right arm. This continued without abatement for several hours. The sickness ceased at 11 P. M., but the bowels were moved four times in the course of the night. Towards morning the pain subsided, and she got a little sleep. November 13: The abdomen had much diminished in size, and pulse had fallen to 100. 14th: Expressed herself as feeling better, and was quite sensible, though pale and weak. Pulse 108. Right arm at seat of puncture red and swollen, and the veins of the whole arm were distinctly mapped out. Was able to take a little food without sickness. 15th: Tongue getting natural; pulse 100; abdomen less in size. 17th: Still progressing favourably; a small ulcer had formed on the right arm at the seat of puncture. A slight relapse occurred on the 20th, but after the 22d her improvement was uninterrupted. In commenting upon the case, Dr. Smith observed that he had never seen a patient in a similar condition recover, and, although he had as yet adopted this treatment in this case alone, so successful was the result that he had felt it incumbent upon him to bring the particulars before the Society. He would not at present offer an opinion as to whether the ammonia acted as antidote or stimulant.

MR. SPENCER WELLS said he had been struck by Dr. Halford's reports, and last March he had injected half a drachm of liquor ammoniæ into one of the veins of the arm of a woman two days after ovariectomy. The pulse and temperature had risen to 140 and 102.8°, with the usual signs of fibrinous deposit

in the heart. Scarcely more than a momentary revival followed the injection, nor more after another by Dr. Junker two hours afterwards. A large fibrinous clot was found after death filling up the left ventricle. Mr. Wells suggested that if Dr. Smith's example is followed, great care should be taken only to inject ammonia where there is an excess of fibrine in the blood; to inject it in cases of any low form of fever or blood-poisoning, where the breath exhaled is charged with ammonia and the blood is already too fluid, would be excessively dangerous.—*Medical Times and Gazette*, Jan. 1, 1870.

55. *Sulphites in Puerperal Affections*.—A series of long articles have been communicated to the *Wiener Medizinische Wochenschrift* (Nos. 94 to 99, 1869) by Profs. BERNATZIK and BRAUN, on the administration of sulphites and hyposulphurous acid to lying-in women, so strongly recommended by Polli, de Ricci, Cummins, and others, as agents by which fermentative processes in the blood could be arrested, and which, as a consequence, were well adapted for employment in zymotic diseases. The results of their investigations appear to be decidedly against their use. They are exceedingly nauseous to the taste, frequently producing inclination to, if not actual vomiting. They have a great tendency to produce diarrhœa of a violent character. The professors are unable to corroborate Polli's assertion that the sulphites diminish thirst and feeling of heat. For these reasons they think the remedies in question are decidedly contraindicated in puerperal affections.—*Practitioner*, March, 1870.

56. *Treatment of Procidentia Uteri*.—Dr. GIBSON, in a paper read before the northern branch of the British Medical Association, observes that, whilst the descent of the uterus is in the direction of the axis of the brim of the pelvis, the effects of the displacement are not usually severe; and in its progress in the direction of the axis of the pelvic outlet to a point beyond the vulval orifice, it is remarkable how frequently the procidentia is sustained without great injury to the health of the patient. Sometimes, however, even when slight, there is a considerable amount of suffering. So long as the course of the descending organ is in the line of the axis of the inlet of the pelvis, Dr. Gibson considers that no surgical operation at present recognized is required for its relief or cure; but when the descent is in the line of the axis of the outlet, and has reached or passed the vulva, the question of some surgical operation may reasonably be entertained. The slightest forms of the malady, like the most complete, are frequently associated with leucorrhœa and portal congestion. For the removal of the latter condition he recommends, after judicious regimen, the agency of podophyllin, duly protected; of chloride of ammonium, with or without hydrochloric acid, or the latter drug in some bitter infusion with mild aperients. For the former, the removal of the congestion on which it usually depends by sustained rest in the horizontal position, and astringent applications are indicated. The dress should be attended to, and all articles of clothing causing unequal compression of the thoracic and abdominal viscera prohibited. The abdomen at the same time, especially if pendulous, should be supported by a well-adjusted elastic bandage. Careful regiminal treatment and cold baths should be adopted, and sexual congress be rare. It sometimes becomes necessary to remove the hypertrophied condition of the uterus, whether this is the expression of *post-partum* subinvolution or of chronic vascular engorgement, and for this purpose the ergot of rye is most efficacious, especially when supplemented by rest, frictions, cold injections, and sedatives. Beneficial effects may also be obtained from the iodide and bromide of potassium, iodide and chloride of iron, chloride of ammonium, and perhaps mercury. In the great majority of cases of procidentia uteri there is relaxation and descent of the *anterior* walls of the vagina above the highest point of its attachment to the urethra; hence the suggestion by Dr. Sims of removing portions of the mucous membrane, and approximating the edges of the wound. The posterior wall of the vagina may be removed in the same way as proposed by Dr. Hewitt, but Dr. Gibson thinks neither of these operations advisable, being uncalled for when the procidentia is slight, and inefficient when considerable. Other operative proceedings are alluded to by Dr. Gibson as having been attended with

very satisfactory results in other hands, such as the formation of an artificial hymen, the removal of the edges of the labium, the incision being begun about an inch below the superior commissure on either side, and uniting in an arched form half an inch behind the frenulum; but his personal experience is adverse to the general adoption of these operations. He thinks they are by no means free from danger, and that they are rarely if ever necessary. Dr. Gibson holds that, even in very bad cases, a well-adjusted pessary will sometimes retain the uterus within the vagina; and he favours the employment of a procidentia truss, consisting of a band of elastic metal encircling the pelvis, which is bent downwards anteriorly and terminates in two digital processes, which have an action upwards, backwards, and towards each other. By the use of this instrument the vagina is supported by the intermediate agency of the vagina, and not by direct pressure on the uterus itself.—*Practitioner*, Feb. 1870, from *Brit. Med. Journ.*, Nov. 20, 1869.

57. *Treatment of Vaginismus*.—Dr. TILT deprecates the division of the vaginal sphincter for the relief of this distressing infirmity, and thinks the best mode of cure is by forcible distension. To effect this forcible distension he places the patient under the influence of chloroform, and then gradually introduces the two thumbs into the vagina. Placing them back to back he separates them more or less, according to each particular case, and thus forcibly keeps the vagina distended for five or six minutes. He then introduces a large metal bougie, which is kept up by a T-bandage, and this may be worn with advantage for several days after the operation. Dr. Tilt considers that cases justifying a recourse to this mode of treatment are exceedingly rare, and that in most of the cases in which he has been consulted it has been a symptom of some form of uterine disease, or of vaginitis in very nervous women, and in these he has solved the vaginal spasm by curing the disease by which it was caused. Hence no kind of vaginal distension should be resorted to by the surgeon until he has convinced himself that there is no disease of the reproductive organs to account for the vaginismus.—*Practitioner*, Feb. 1870, from *Lancet*, Dec. 18th, 1869.

Dr. WHARTON P. HOOD records (*Lancet*, Dec. 11th) a severe case which he relieved by introducing a Weiss's dilating bivalve speculum into the vagina, expanding the blades of the instrument by the screw action and allowing the instrument to remain for five minutes. A slight feeling of discomfort was experienced for four or five days, but after that no difficulty was experienced in effecting complete intercourse.

58. *Death from Peritonitis following an Intra-uterine Injection*.—Dr. von HASELBERG reports a case of death from peritonitis consequent upon the injection of perchloride of iron into the uterine cavity. The case is so completely observed, and so important, that it calls for full reproduction. A puella publica, 32 years old, having had an abortion at six months some time before, came under treatment with anteflexion of the uterus to such an extent as to render the passage of the sound difficult. The vaginal portion was enlarged, and an easily bleeding ulcer existed on the anterior lip, extending into the cervical canal. The sore was touched with nitrate of silver. Profuse bleeding followed, partly from varicose vessels surrounding the sore, partly from the uterine cavity; and even after the ulcer was nearly healed by the use of alum-plugs profuse menorrhagia occurred. It was therefore determined to try injection of perchloride of iron, but it was only after repeated trials that at last the syringe was got beyond the point of flexion of the canal into the cavity of the uterus. Immediately after the injection the patient suffered no pain, but in the night a severe rigor, with consecutive sweating, occurred. This was repeated every night, notwithstanding the use of quinia.

The patient quickly collapsed, even before signs of peritonitis set in. On the fifth night rigor was accompanied by severe vomiting, and immediately abdominal pain followed. In the following night, whilst vomiting, terrible pain suddenly came on in the abdomen, whereupon she fainted and died.

Autopsy.—The abdomen was much distended. Being opened, a large quan-

tity of stinking gas escaped. The intestines were united by recent exudation; the lower parts of the peritoneal cavity were filled with stinking pus of grayish colour. The source of this matter was discovered in a cyst of the right ovary, the size of a fist, whose walls had fallen in, and out of which, by pressure, matter of like appearance could be squeezed through a small opening. On the upper surface of the cyst the opening of the right Fallopian tube was found. From this a large sound could be passed the whole length of the tube into the uterine cavity. The mucous membrane of the uterus was stained pitch-black, as if with ink, and the same colour extended along the right tube to its outer extremity. The mucous membrane of the left tube was slate-gray. Pieces were taken from the uterus and the right tube, and were seen to be pitch-black for a depth of $\frac{1}{2}$ to 1 millim. Chemical reaction showed in these parts a copious infiltration with iron. Small pieces of the surface were steeped in weak hydrochloric acid, whereupon the black colour disappeared. Prussiate of potash added to this solution caused a red colour, and sulphide of ammonium added to the neutralized solution caused a turbid black-gray colour.

V. Haselberg then discusses the features of the case and the precautions to be adopted in intra-uterine injections. He has derived the most signal advantages from the practice. Opinions differ widely as to the possibility of injected fluids passing along the tubes into the abdomen. The experiments of Hennig and Klemm on the dead body prove how difficult it is under normal conditions to inject through the tubes, even with closure of the os uteri internum, a great quantity of fluid, and considerable pressure; and in the living subject the probability must be still less, since these three conditions do not exist. It is true, nevertheless, that the conditions in the living are not known, and Hildebrandt and Matthews Duncan describe an abnormal opening of the tubes to such an extent that even the point of the syringe could be introduced. In the case under discussion such a dilated condition of the tube existed. He quotes Gailard Thomas (*A Practical Treatise on Diseases of Women*, 1868) as giving a case in which fluid passed along the tube, and Mandl (*Wien Med. Presse*, 1869) as saying that this passage easily and often takes place, and that even a drop of water in the tube will cause the most acute pains. Other injuries may be caused by the mere introduction of the syringe, as laceration of the uterus, tearing of peritonitic adhesions, hæmatoceles. And there are puzzling cases of simple vaginal injections followed by pain, convulsions, and fatal peritonitis.

V. Haselberg does not think the preliminary dilatation of the uterus so important a safeguard as others do. He thinks it more important to suck back into the syringe the superfluous fluid injected. But in spite of all precautions he cannot be sure that pains or perimetritis will not arise. (In the case under discussion the cause of death was clearly the peritonitis; the immediate cause of the peritonitis was the rupture of the ovarian cyst and the escape of its foul contents into the peritoneum. It is possible that the severe vomiting caused the rupture of the cyst, so that the injection cannot be regarded as the direct cause of death. The state of the right tube, however, proves that in some cases fluids injected into the uterus may traverse the tubes. This danger may certainly be lessened by previously securing full dilatation of the cervical canal, and using a swab instead of the syringe.—R. BARNES).—*Brit. and For. Med.-Chirurg. Rev.*, Jan. 1870, from *Monats. f. Geb.*, 1869.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Pseudo-Membranous Croup; Tracheotomy; Recovery. By RICHARD A. CLEEMANN, M. D., of Philadelphia.

The propriety of tracheotomy in pseudo-membranous croup is so vexed and so important a question, that the following record of a case, in which the operation was succeeded by recovery, may not be without interest. The brief narration, too, will be found, I think, to illustrate well some important events in the natural history of this fell disease.

October 14, 1869. I was called to see a girl æt. $4\frac{1}{2}$, said to be suffering with *diphtheria*. She had been hoarse, according to the mother's statement, for about three days; was now feverish; showed no marked debility; her fauces were reddened, and there was a spot of yellowish exudation over a portion of the left tonsil. A "chlorine mixture" was prescribed, and, should difficulty of breathing occur, an emetic of powdered alum was directed to be given.

Being informed the next day that the child was much better, I did not see her again for three days, when I was sent for hurriedly, with the announcement that the child was suddenly much worse. On my arrival, some hours afterwards, she was said to be better. From the description of her symptoms, however, it was evident that she had experienced a paroxysm of croup. The fauces, on examination, were now clear of exudation. This aggravation of the symptoms was ascribed by the mother to the causeless exposure out-of-doors that morning, the day being cold and damp. The use of a simple poultice on the neck was added to the previous treatment.

No subsequent paroxysm was observed till the second day following (Oct. 19); but the voice and cough became more hoarse, the breathing noisy, and evidence of imperfect aeration of the blood manifest. The paroxysm came on in the afternoon, after remission of the symptoms in the morning, and lasted until midnight. A cough mixture had been added to the treatment, the day previous, and concentrated nourishment advised.

In the morning of the following day (Oct. 20), the pulse of the little patient was 120; the respirations very noisy, 24; the face somewhat livid, but the prolabia still of a bright colour; the tongue clean and moist; on the right tonsil was a speck of white exudation. Sulphate of copper, in quarter of a grain doses repeated, was substituted for the alum. In the evening the breathing was still more laboured, though at the same rate, and the pulse difficult, from its frequency, to be counted. Dr. H. Lenox Hodge now saw the case, in consultation with regard to the immediate resort to tracheotomy. It was decided to delay the operation till the next morning, and, in the mean time, the spray of lime-water was to be locally applied by means of the "atomizer."

21st. Child still worse; very restless, the breathing becoming more and more embarrassed; and, though the prolabia were still of a rosy hue, it

seemed certain that, without surgical assistance, the child must soon die. The trachea was, therefore, opened by Dr. Hodge, at 11 A. M. He used in the operation a small narrow scalpel, forceps, a strong director, a tenaculum, and a pair of curved scissors; at hand, in case of hemorrhage from divided vessels, were ligatures, threaded sewing and aneurism needles. The patient was laid supine, on a table, with a large pillow doubled up under her shoulders, and her head was held firmly backwards; the skin of the extended neck was now incised, for a length of two inches, longitudinally, in the median line, just above the sternum; the fascia being reached, it was divided with the scalpel over the director, and the opening enlarged by tearing with the latter blunt instrument; the director was then used alone in separating the underlying tissues; the bloodvessels being pushed aside, till the rings of the trachea came in view, the tenaculum was then thrust into the windpipe, and this drawn forwards, when the scalpel was quickly plunged into it, below the crossing of the isthmus of the thyroid body, and several of the rings divided. Frothy mucus appeared at once at the wound, and the suffocation of the child seemed imminent; a double tracheal tube was immediately inserted, without removing the tenaculum, and the natural movements of respiration imitated by intermittent pressure on the patient's chest. Unassisted breathing was soon reestablished, but the rhythm was quite disturbed for several minutes. When, after the lapse of a quarter of an hour, it had become more tranquil, the tracheal tube was withdrawn and the tenaculum cut from its position with the curved scissors; a lozenge-shaped piece of the trachea was thus removed, in breadth at the widest part about $1\frac{1}{2}$ line, and involving in its length the whole thickness of two of the cartilaginous rings and portions of those immediately above and below these. The tube was again inserted, a tape passing round the neck confining it in proper position; a cotton cloth, moistened with glycerine, covered the skin for some inches about the wound, and folds of coarse gauze, saturated with the same fluid, were laid on the orifice of the tube. The child, being now laid quietly in bed, seemed to fall immediately into a tranquil slumber; she had borne the shock of the operation well, and as no considerable bloodvessel had been severed, had lost scarcely any blood. The use of the "atomizer" and the administration of the cough mixture were continued; concentrated nourishment and stimulants insisted upon. The inner cylinder of the metallic tube was removed and cleansed from time to time, as it became clogged with the tracheal secretion. In the evening, the child was doing, on the whole, well; but the face was much flushed, and "beaded" perspiration stood upon the brow.

Oct. 22. Skin of normal temperature; the circulation and breathing accelerated, and of varying rate. By evening, the cough became very troublesome and the respiration more difficult; indeed, the child seemed so near suffocation about 8 P. M. that the entire double tracheal tube was removed. This permitted the escape from the trachea of a large piece of false membrane, tubular in form, which followed almost immediately the withdrawal of the instrument; and the little sufferer became at once much more comfortable. But, as the night wore on, the child grew worse again, while small pieces of membrane were ejected at intervals from the wound (as had indeed been the case before the tracheal tube was laid aside), and the edge of an apparently large fragment could be seen advancing through the aperture, in the paroxysms of coughing. Attempts were made to seize this extremity, which finally proved successful (at 4 A. M., Oct. 23); and a tubular piece of false membrane, about $1\frac{1}{2}$ inch long, by $1\frac{1}{2}$ inch broad, was

withdrawn. The removal of this, as of the first large fragment, was succeeded by immediate relief.

By morning of Oct. 23, the general appearance of the patient had become more natural, the congestion of the exterior tissues having diminished; she still appeared to sleep continuously as she had done since the period of the operation; there was little fever; pulse 140; respiration 36; tongue covered, except at the edges, with a white coating; expectoration discharged through the wound, purulent. During the day, more false membrane came away, in pieces of varying size: one portion was perhaps two and a half inches in length and prolonged at one extremity with a seeming branch. The temperature of the room was now raised to 90° Fahr. and an attempt made to impregnate the atmosphere with the vapour arising from a vessel of boiling lime-water. The child had become very feverish by evening, and passed a restless, sleepless night.

24th. Her pulse has risen to 144; respiration decreased to 32; tongue heavily furred; began to speak faintly. Evening, the breathing being noisy and the face flushed, the tracheal opening was enlarged by the passage and withdrawal of the metallic tube. This measure had the happiest effect; the coughing with which it was attended caused the expulsion of grayish pus, and the breathing immediately became quite tranquil.

25th. Passed a quiet night; was without fever, but pulse seemed weaker. When she attempted to swallow anything, part of what was taken passed into the trachea and out through the wound, giving rise to violent paroxysms of coughing. The child did not complain of this, and it was very effectual in removing the disordered secretions from the air-passages.

26th. Still doing well; tongue losing its coat; a miliary eruption was observed, which was considered as due to the warm and moist condition of the atmosphere. The tracheal tube was again inserted and withdrawn, as was the case whenever the aperture appeared to be somewhat clogged with the morbid secretions.

27th. Temperature of the room lowered to 75° Fahr., the atmosphere being still charged with the watery vapour. A pseudo-membranous exudation being clearly present on the wound, it was treated with the application of the solid nitrate of silver.

During the succeeding days, the little patient continued to improve, and, on October 30, the wound into the trachea was dressed with simple cerate and allowed to close. By the 15th of November, the aperture was so much diminished in size, that it was only by the passage of a little mucus through it, during the fits of coughing, that its patulousness was determined.

Convalescence, however, was prolonged and marked with considerable debility. In the early stages, the sensibility of the bladder was diminished, the urine was secreted in less than normal quantity, was turbid, and at one time streaked with blood. The bowels were constipated, as had been the case during the disease. Small subcutaneous abscesses appeared in the scalp. The treatment, during this period, consisted in the administration of a tonic and laxative mixture, and of an anodyne cough syrup.

Towards the close of November, the cough, which still remained in some degree, became more troublesome, and attended with expectoration, while the peculiar, audible breathing, pointed to some narrowing of the superior air-passages. The condition was, however, very transient, and furnished no evidence of a reproduction of false membrane.¹

¹ The child is now, Jan. 10, 1870, quite restored to health, if we except some degree of anæmia and an occasional disposition to cough. Her voice is strong and clear.

I would call especial attention to the following points, noted in the above record :—

1. The speedy disappearance of the exudation on the tonsil, as contrasted with the usual behaviour of the false membrane in "diphtheria;" and—

2. The long periods of exemption from paroxysms of dyspnoea, as opposed to what occurs with the extreme irritability of the larynx in "inflammatory croup."

3. The immediate necessity of the operation, in the opinion of Dr. Hodge and myself, so long a period as thirty-three hours before any considerable portion of membrane was discharged. This as showing the futility of the "expectant" method in such a case.

4. The difficulty of the passage of large pieces of membrane through the tracheal wound, even when an actual *excision* of the walls of the windpipe had been made. I may remark that, though a simple *incision* into the trachea will undoubtedly leave a gaping aperture, still it seems evident that the *shape* of such an opening will be less favourable for the transit of false membrane, than that of one made as above.

5. The condition of the fauces in permitting the regurgitation of fluids and their passage into the larynx, as suggestive of the paresis of "diphtheria." Likewise, in this connection, the state of the bladder and urine in convalescence.

340 S. Twenty-first St.

A Case of Hereditary Epilepsy Cured by Bromide of Potassium. By HENRY K. STEELE, M. D., of Dayton, Ohio.

November 19, 1866, I was called to Miss E., aged about 15, who was suffering for the first time from an epileptic paroxysm. She had recovered from the attack when I reached the house. Her catamenial period had just commenced, and the flow was still on her. I prescribed a solution of bromide of potassium, ten grains three times daily, with directions not to omit it until I gave permission. On the 29th May, 1867, almost six months afterward, I was again called to see her. I learned that having presumed she was well, she had omitted the medicine for three weeks, and was now undergoing a second epileptic paroxysm.

I repeated the prescription, impressing upon her the importance of continuing it; which she has done to the present time, a period of two years and almost four months from the date of the last attack, without the omission of a single day, and without the recurrence of a paroxysm.

It has been suggested that after fifteen or sixteen months' exemption from the disease a cure might be considered effected, but I have not thought advisable to follow that suggestion, although emanating from so distinguished a source as Dr. Brown-Séquard; on the contrary, in May, 1869, after an uninterrupted continuance of the remedy for two years, I added five grains of the bromide of ammonium to each dose, believing that the system having adopted and appropriated as part of its natural sustenance the bromide of potassium, it might require a little more of the bromine as a counteracting tendency to the disease. She still continues the prescription, therefore, as increased last May.

The mother of this young lady, whom I saw frequently, was attacked with epilepsy about the same period of life her daughter was. The attacks were not controlled, but became gradually more frequent and violent; insanity followed, and she died in an insane asylum, the epilepsy continuing to the close.

Hypodermic Injection of Morphia in Congestive Chills and in Puerperal Convulsions. By JOSEPH E. GARRISON, M. D., Asst. Surg. U. S. N. (Communicated by Prof. Ellerslie Wallace, M. D.)

CASE I. Last August while at the Creek Indian Agency, Indian Territory, I was called to see a coloured woman who was in a congestive chill. The Indians and coloured people were doing all that is generally laid down in books in such cases. As I was called in I had to do something, so I injected hypodermically about a half grain of morphiæ sulph. in her arm. Before I could put up three five grain quinia powders, she asked to get out of bed, and did so. She said that she did not know that I put anything into her arm, or was about the premises. I gave her the fifteen grains of quinia, and followed up the treatment with Fowler's solution in five drop doses, and she had no recurrence of the chill.

CASE II. Last September while "en route" from Fort Gibson, I. T., to Fort Scott, Kansas, I was called to one of my sick wagons to see a man, and found him in a congestive chill. I at once injected hypodermically some sulphate of morphia; he revived in a few minutes.

CASE III. About a week afterwards, towards evening I was called to see one of the cooks of "I" Co., 6th Infantry, who was lying in a tent in a congestive chill. Again I injected morphiæ sulph., and in a few minutes he wanted to go out of the tent.

CASE IV. Last October a teamster of "G" Co., 6th Infantry, was found lying in his wagon in a congestive chill. I injected sulphate of morphia, and he was able to sit up in a few minutes.

The last three cases were afterwards treated with sulphate of quinia only, and recovered without the second congestive chill. Each case immediately after returning to consciousness wanted to urinate.

CASE V. Last week, after a case of labour, the woman had a puerperal convulsion. An injection hypodermically of morphiæ sulph. actually cut short the convulsion.

FIELD CAMP, NEAR COLUMBUS, CHEROKEE CO., KANSAS, Jan. 30, 1870.

Rare Obstetric Cases. By J. F. BEAUCHAMP, M. D., of Vermilion, La.

CASE I. *Fœtus with absence of cranial bones.*—Mrs. B., aged 21, good constitution, and in her fourth pregnancy, was taken with labour pains, and I was sent for. The labour was progressing favourably, and there was no untoward symptom. After waiting a short time, I made an examination, and found the os uteri soft and dilating freely, the pains strong and of sufficient force, and I concluded that the case was one of breech presentation, believing fully that I had touched the nates and could feel all the surrounding and adjacent parts. Nothing unusual occurred, and the patient was delivered of a large-sized male child; but, to my mortification, that portion which I had taken to be the nates proved to be the head, but devoid of any bony covering whatever above the eyes. The brain, which was well formed, was covered only by a very thin and almost transparent membrane, which allowed the commissure of the cerebrum to be felt, and thus deceived me in regard to the presentation. The fœtus was stillborn and weighed $8\frac{1}{2}$ pounds, and, with the exception of the deformity mentioned, was well developed in every way. Finding that the case was one also of twins as well as monstrosity, I succeeded in delivering my patient of a second, well-formed, but smaller living child; and nothing unusual occurring, the mother made a good recovery, and both she and the child did well.

CASE II. *Twins, one dead and retained.*—Mrs. W., aged 22, and in her

third pregnancy, was taken in labour on the 22d of March, 1868, and, it being some distance from my house, an intelligent midwife was called in, who delivered her safely of a small but fully-formed fœtus, which had evidently been dead several days, as evinced by the condition of the skin and the odour which accompanied its expulsion. This was followed by total cessation of all uterine action, and although the placenta was retained, the midwife deemed it most prudent to await the efforts of nature. The abdomen being still very large, and light pains returning, I saw her on the evening of the 25th. Upon examination, I discovered the presence of a second child, of which she was safely delivered in a short time, the presentation being the head; and as nothing unusual occurred, both mother and child did well.

CASE III. *Twins; body and limbs of one fœtus delivered; its head, with second child, retained three days.*—Mrs. G., aged about 30, in good health, and in the fourth month of her pregnancy, was suddenly seized by severe uterine pains, and before her medical attendant arrived she was delivered of a fœtus of about three months, which was entire and well formed, save that the head, having been separated from the body, from some cause, he said, to him unknown, remained in the uterine cavity. Her attendant having administered ergot in large and repeated doses, and failing to excite any uterine action whatever, concluded to leave the case to nature and watch the result. Two days after, the patient was seized with a slight rigor, and, after a few light expulsive pains, was delivered of the head of the fœtus, together with portions of the sac, in a state of decomposition. Twenty-four hours after this last event, and three days from the period when she passed the body and limbs of the first fœtus, I was hastily summoned to her, as she had been taken with a severe rigor, followed by what was clearly severe expulsive uterine action, and I had the good fortune to arrive in time to assist in the delivery of a *second* fully-formed fœtus of the same age as the preceding, and followed by the placenta and the remaining portions of the sac; and although she had suffered severely from the hemorrhage, which was at one time alarming, she made an excellent recovery.

[*Remarks.*—Case I. is a rare, but by no means an undescribed deformity *par defect*. Analogous cases may be found in the works of several teratologists.

Case II. is by no means rare, numerous cases having been recorded of twins in which one fetus has been retained for days, and even weeks, after the birth of the other. See Velpeau, *Accouch.*, tom. ii. p. 246, &c.

Case III. is unique in some points, but in others not altogether without precedent. Kiesling, quoted by Sue (*Essais Historiques sur l'Art des Accouch.*, vol. ii. p. 395), narrates a case where a head at term came off, and remained twenty days in the womb after the delivery of the child's body. At the end of that time it was expelled naturally, in a putrid condition, but with no bad results to the mother.

W. G.]

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Extra-Uterine (Abdominal) Conception; Delivery per Anum; Recovery. By W. U. GIBSON, M. D., of Gordon, Ga.

Mrs. S., æt. 37, medium height and full habit; at the age of 31 years was delivered at full term of a still-born fœtus, and two years after of a living child by means of forceps.

Early in March, 1869, I was called to her, she being threatened with abortion. Directed ext. hyoscyami, gr. xxx; morphia sulph. gr. vj.—

Ft. pill. no. xxx, one every four to eight hours, which relieved her for the time. In May and June she had occasional attacks of diarrhœa. Not being regularly engaged in the practice of medicine at that time, I saw but little of the case until the middle of July, when she had an obstinate attack of dysentery, complicated with intermittent fever, which was relieved by appropriate remedies within the week. Early in August was again called to her, when she was suffering from an obstinate and very offensive diarrhœa, at times very painful. Soon after this Mrs. S. called my attention to the fact that there was a great change in the general appearance of her abdomen—the rotundity usual in pregnancy was gone; the outline of a foetus was very distinct, even to hands and feet. Up to 1st Sept. she had repeated attacks of diarrhœa or dysentery.

At 4 o'clock A. M. on the 4th Sept. I was hurriedly called to her, and as soon as I reached her bedside she said to me, "There is something wrong down there; while up at stool I found a bone out." On examination, found femur of left leg hanging from anus. Digital examination per anum revealed pelvis, spinal column, with most of ribs attached, which I delivered at once. This caused great pain, as did also examination per anum, on account of piles, which were troubling her very much at this time.

Dr. Thomas Gibson passing, I called him in to see the case with me. We suggested castor oil $\mathfrak{z}$ iss, and spts. turpentine $\mathfrak{z}$ ss, which were given at once. By 2 o'clock P. M. the discharges (which were altogether liquid) were so painful and exhaustive and without the desired result, that I deemed it expedient to check them, which I did by means of opium, camphor, and hyoscyamus pills. Examination now revealed impacted feces just at end of finger reach. Directed enemata for the purpose of dissolving the impacted scybala, at same time anodyne, tonic, and supporting treatment. Up to this time pulse had been from 70 to 80 beats per minute; respiration easy and only a little hurried; passed no more bones to-day; bladder relieving itself without catheter. 5th, 6th, and 7th, ribs passed at different times and in order named; one arm entire to wrist, humerus of other and femur of right leg. Afternoon of last named day Dr. Case, of Milledgeville, saw the case with me. He advised continuance of treatment and the use of injections per vaginam, as he deemed it better to wait on nature, giving such aid as may be necessary, than to attempt any interference to hasten the process. On the 8th, 9th, 10th, and 11th, occasionally passed bones, among which were those of leg, arm, small bones of feet and hands, shreddy portions and sometimes very offensive fluids. About this time commenced to pass in large quantities scybala, some as large as a good-sized hen's egg. Then began her greatest troubles, in addition to passage daily (about same hour of day) of these large hard scybala, a very offensive and purulent fluid was discharged, causing sickness and debility. Examination, per vaginam, revealed the fact that a small sinus had been formed in posterior portion of vagina, through which this fluid was passing into the vagina, and slowly yet continuously discharged. Directed weak solution of carbolic acid as enema, to be repeated every six hours. In a few days fluid per vaginam ceased, sinus closed, pulse had risen to 90. Continued opiate; tonic and supporting treatment. Except at time of passing scybala and occasional bones of head, which were very painful, patient rested comparatively comfortable. She was very much debilitated and emaciated, yet she kept up well.

The quantity of the hard scybala passed during the four weeks (that is, up to the 12th of October) was surprising—not less than sixteen pints.

Soon after the passage of the last scybala came remaining bones, head, and some of smaller bones, all very much worn and dissolved down. About the 12th of October the last scybala and bones were passed, leaving Mrs. S. very much emaciated and debilitated, yet in hopes of recovery, as she was through her unusual and prolonged delivery, near six weeks. She improved slowly, and though not able to attend to all her household duties, yet was able to be up most of time and occasionally to visit.

December 1. Called on Mrs. S. a few days ago; found her not improved as much as I expected, having been troubled with a light attack of an intermittent character, leaving her weak and with night-sweats, that bane of all debilitating diseases. Suggested simple bitter with aromatic sulph. acid. three times daily, and especially at bedtime. She informed me that she had menstruated once since I saw her, that while it was a little more painful than usual, it was almost natural. Her bowels trouble her now occasionally, being moved two or three times with pain, but 3j tr. opii camph. controls them and gives ease.

Fatty Degeneration of the Placenta. By ANDREW C. KEMPER, A. M., M. D., of Cincinnati, Ohio.

September 25th, 1868, Mrs. —, æt. 33, had always enjoyed excellent health; uterine functions perfectly regular; nearly two years after her marriage; she supposed herself for the first time pregnant, her catamenia having ceased. She experienced all the usual effects of that condition, without any unfavourable symptom, until February. About the first of January she had suffered for several days from mental anxiety, and in the second week in February she became aware of a sudden diminution in her size, after which she was not larger than previous to her conception. There was no discharge or other sensible cause for this. About the middle of April some dribbling hemorrhage occurred, and continued for a couple of weeks. Medical advice was sought, but without any practical solution of the difficulty, except to convince her that she was mistaken in the supposition that she had been pregnant. The hemorrhage returned on the 19th and 20th of May, and on the 30th, after two or three sharp labour-pains, a blighted fœtus, of apparently two months, was expelled from the uterus. Membranes were of a dark, dusky, Modena colour, unbroken, and showing the form of the fœtus through them. Placenta normal size for fœtus of two months, entirely composed of fat, but resembling on its uterine surface the outer layer of fat on the ribs of beef, and was unctuous to the touch. Uterine surface presented two irregularly shaped, branch-like bloody streaks, three lines broad, and an inch and an inch and a half long respectively, very nearly at right angles with each other. Excepting these streaks, there was no appearance of vessels upon or within the placenta. The anterior wall of the abdomen seemed to be of more than ordinary thickness. The pelvis was of good shape and well developed. The lochial discharge ceased on the fourth day. On the sixth day there was a sudden gush of blood from the uterus that blanched the cheeks and lips of the patient. Since then there has been no discharge. The convalescence has been rapid, and the patient has been going about the streets for several weeks apparently in perfect health.

101 BROADWAY, CINCINNATI, OHIO, July 23, 1869.

DOMESTIC SUMMARY.

Does the Maternal Mental Influence have any Constructive or Destructive Power in the Production of Malformations or Monstrosities at any Stage of Embryonic Development.—The *American Journal of Insanity* for January of the present year contains an elaborate and well-considered article on this subject by Dr. G. J. FISHER, of Sing Sing, New York.

The following is a summary of the conclusions at which the writer has arrived by his inquiries, observations, and reflections on this subject:—

1. That traditional superstition has perpetuated the notion that malformations are the result of maternal mental emotions.

2. That the medical profession is in no inconsiderable degree responsible for the existence and continuance of this popular error.

3. That various intense mental emotions are common with gestating women, and apprehensions of malformation of their offspring exist in the minds of a large portion, yet abnormal births are extremely rare.

4. That there is nothing like law in the alleged results of maternal mental influence in the production of malformations.

5. That the occasional apparent relation of cause and effect is due, in most instances, to accidental coincidences, which would be far less frequent if the facts could be obtained *previously* instead of *subsequently* to the birth of the child.

6. Coincidences are not sufficiently numerous and authentic to warrant a rational belief in the origin of monstrosities from the perturbed emotions of the mother's mind.

7. Like causes produce like results; whereas we find that in a series of cases of any special variety of malformation, mental emotions, arising from a considerable number of dissimilar objects, even of the most diverse character, are assigned as the cause.

8. In a large proportion of the cases of malformation no mental or even physical explanation is offered by the parents or friends.

9. There is no relation between the number and character of the mental emotions and apprehensions of pregnant women and the actual frequency and variety of malformations.

10. That some of the assumed causes are alleged to have operated upon the embryo or foetus subsequently to the normal period for the evolution of the part which is found to be the seat of the malformation, thereby implying a destructive as well as a metamorphosing power in the mental emotion!

11. That the alleged resemblances of various congenital maculae to fruits and animals, are either accidental, as in the case of rocks, the outlines of mountains, and the forms of clouds, which exhibit the profile of the human head and face; or they are the result of pure imagination and fancy on the part of the observer. The same is true of the alleged resemblances of more important parts or members to the corresponding parts of animals.

12. Malformations identical in kind and in degree recur again and again in the human subject, and admit of a systematic classification. They are not infinite in variety, but definite and distinctive.

13. Every form of malformation and monstrosity which has occurred in the human subject has had its exact morphological counterpart in the lower animals, as well in the oviparous as in the viviparous.

14. The vegetable kingdom produces analogous anomalies of organization to those found in the animal kingdom, viz.: dwarfish, gigantic, distorted, and double malformations.

15. The only rational and scientific explanation of abnormal development is to be sought in the realm of pathological histology. The pathology of foetal life presents a rich field for hopeful research.

16. Monstrosities are not the result of *violations* of embryological or physiological laws; they are the product of *embarrassments* to normal development.

17. Vices of conformation and monstrosities are due to either retarded, arrested, or excessive development.

18. That in plural conception it is particularly absurd to suppose that a mental emotion can be conveyed to one foetus in the womb and be inoperative upon another, whether the emotion be transmitted through the medium of blood, by undiscovered nervous filaments in the funis, or by a sort of animal electricity or magnetism directly across tissues.

19. The development of united-embryos, or double-foetuses, is now positively known to follow definite laws, including homologous union, unity of sex, and right and left bilateral symmetry.

20. Monstrosities never consist of parts or organs which do not belong to the species which is the subject of abnormal development.

21. Monstrosities may arise from either abnormalities of the generative matter of one or both parents, abnormalities of the maternal organism, or from diseases and abnormal states of the membranes of the ovum and of the umbilical cord.

22. That the time has fully arrived for the explosion of the popular error which attributes anomalies of organization to mental emotion.

23. That it is the duty of the medical profession to endeavour to correct this popular error by teaching the people the absurdity of their "unquestioned faith" in such an inadequate power to pervert or destroy the laws of organic development.

Superlaryngeal Encysted Tumours; or Encysted Bursal Tumours in Front of Larynx.—Dr. F. H. HAMILTON describes (*New York Med. Journal*, March, 1870) a small encysted tumour which forms pretty frequently upon the front of the larynx, and which, so far as he knows, has not hitherto been described. "Of the nine or ten cases," he says, "which have come under my notice, the position has ranged from a point just above the thyroid cartilage to a point in front of the cricoid cartilage: but in most cases they have been situated directly in front of the crico-thyroid space. Seven of the whole number have occurred in females; several of them commenced in early childhood, or during infancy—possibly some were congenital. They have presented themselves uniformly exactly, or almost exactly, in the median line. They have been globular in form, smooth, elastic, painless, and generally without discoloration. They have seldom caused any inconvenience, unless it has been a slight sensation of constriction. I have never seen them attain a larger size than a small orange; and in most cases they have not been larger than a pullet's egg.

"Occasionally they have disappeared somewhat suddenly, but only to reappear after a short period; and in one instance the sac was evidently emptied into the larynx, the contents being coughed up. In one case the tumour disappeared, and had not returned at the end of two years.

"The contents of the tumours have, with one exception, been found to be a thin, yellowish serum. In the exceptional case the serum was mixed with blood, the walls being hemorrhagic. The walls of the cysts have been uniformly thin, and firmly attached to the portions of the larynx over which they were situated.

"The surgical treatment which I have adopted has been either incision or excision. Excision is difficult, owing to the thinness of the walls, and to the close attachment of the base to the larynx. Excision has been followed once by sufficient laryngeal irritation to cause some anxiety. Latterly, I have simply laid them open freely, and cut away the projecting portions of the sacs, leaving them to suppurate. When suppuration has failed to destroy the secreting surfaces, they have been made to granulate and cicatrize from the base, by daily injections of the tincture of iodine. In every instance in which the patients have remained under my observation, any length of time, a complete cure has been effected. In regard to any other of those plans of treatment which might naturally suggest themselves, such as the employment of internal remedies, and the application of discutients externally, I have no experience; that is to say, I have not tried them to any extent myself: yet, in most or all of the cases which have come under my notice, therapeutical measures have been employed.

"In my opinion these tumours are examples of enlarged bursa." * * *

Most of the examples seen by Dr. H. "have presented themselves below the thyroid cartilage, in some cases as low as the cricoid cartilage; and since they

were, with one exception, globular, I have been unable to regard those situated below the top of the thyroid cartilage as prolongations of the thyro-hyoid bursæ. It is possible, indeed, that the fluid of the bursa may have escaped in this direction, and then have been cut off, by adhesion, from the cavity of the bursa, but nothing in the history of these cases has indicated this, and I do not consider the supposition a probable one. They have from the beginning occupied the same, or nearly the same, position as that in which I have found them.

"Certainly none of them had any connection with the isthmus of the thyroid gland. They were situated always above the gland—in no case nearer than within half an inch; and in no case has there been a simultaneous enlargement of other portions of this gland. In one case the tumour began to form soon after conception, and the thyroid gland is well known to be subject to enlargement under these circumstances; but this tumour was situated at the top of the thyroid cartilage. While, therefore, the thyro-hyoid bursa must explain a portion of these tumours, I am obliged to look for some other explanation of the majority of those which have come under my notice, and I think it may be found in a superficial or subcutaneous bursa, occasionally observed in front of the larynx, caused, probably, by the motion or sliding of the integument over the thyroid and cricoid cartilages—a bursa which may be found, generally small and imperfectly developed, in a certain proportion of bodies."

Resection of the entire Scapula, with Preservation of a Useful Arm.—Dr. M. SCHUPPERT records (*New Orleans Journal of Medicine*, Jan. 1870) a very interesting case of this. The subject of it was a stout unmarried German woman, æt. 36, who came to New Orleans in 1868, suffering from a large tumour comprising the right scapula, for which she had been twice operated on in Germany, which operations left the scapula intact. When seen by Dr. S., the skin covering the tumour showed many cicatrices, from former operations. "The tumour from its posterior margin to the acromion process measured 0.18 metres, the largest extent in a vertical line being 0.21 metres. Active motions of the humerus were nearly arrested, the passive motions very much limited. The extremity could not be further removed from the body than to an angle of 45 degrees. The extensive pain the patient suffered in the arm brought her to me in search of relief. Having given her consent to a proposed removal of the entire bone, the operation was accordingly performed on the 30th of March, 1868, in presence of Drs. Barnes, Gray, Geutebruck, Riley, Schwarzwaelder, and some other medical gentlemen. Patient being in a deep chloroform narcosis, a crucial incision was made through the skin; one cut, beginning at the acromion process and carried over the most protuberant part of the tumour, ended near the spinal column; a second incision over the middle of the tumour bisected the first. The four skin flaps were dissected off and held back by sharp hooks. The acromion process was divided with a small saw, laying bare at the same time the scapulo-humeral articulation. The head of the humerus was then by rotating the arm dislocated inwards, to get at and remove the coracoid process. Lifting up the scapula by its glenoidal cavity, which was found to be involved in the disease, the whole of the scapula was detached from the body by keeping the knife close to the under surface of the tumour. The removal of the tumour left the ribs visible through the cellular tissue, which was all that remained of the subscapularis muscle, lost in the diseased mass.

The bleeding was inconsiderable; the main vessels having probably become obliterated by the former operations; with the exception of a few muscular branches no arteries had to be ligated. The skin flaps were adjusted and united by interrupted pin sutures, leaving an opening at the most dependent part, to permit the draining of the secretion. Acetate of morphia, 0.03 gramme, was subcutaneously injected. After patient had perfectly recovered from the anæsthetic condition she was unconscious that the operation had been performed. The arm was bandaged and kept close to the body supported by a sling.

Patient suffered much nausea subsequently and vomited during several days from the effects of chloroform. No unfavourable symptoms happened to require medication. A nourishing diet was ordered from the first day and continued during the convalescent state.

The sutures were removed on the third day. Most of the incisions had healed by first intention. Suppuration was considerable, and notwithstanding the well draining of the wound two abscesses formed in the arm discharging a great quantity of pus. The wound was syringed out daily with glycerine containing ten per cent. carbolic acid. On the 10th of June, the last secreting opening had closed.

At the present date, eighteen months after the operation, there is no indication of reappearance of the disease in any part of the body. The skin, of which no part had been removed, though after the excision of the tumour it formed a large sac, has so contracted that a part of the cicatrix forms now a portion of the covering of the humerus. Theresa, who enjoys excellent health, has thrown away the sling long ago, the arm has no artificial support, and is a more useful instrument than before the operation. Though its motions are limited, there is sufficient strength in the extremity to lift a weight of thirty pounds and throw it a fair distance.

The tumour weighed nearly six pounds and measured respectively 0.35 and 0.40 metre in circumference. From the original scapula but one third of the spine, a small portion of the coracoid process and the centre of the glenoidal cavity remained intact, all the rest was involved in the growth. The tumour consisted of hyaline and fibro-cartilage with deposits of carbonate of lime in the interspaces of the cartilaginous tissue. Towards the centre, true ossification had taken place. We have to consider it, therefore, to be an Osteochondroma.

New Method of Securing the Pedicle with Silver Wire, in Ovariectomy.—The proper treatment of the pedicle after the removal of an ovarian tumour still remains a mooted question. Dr. THOMAS ADDIS EMMET states (*Am. Journ. Obstetrics*, Feb. 1870), that the various means proposed are all applicable to certain conditions of the pedicle, but no single method has yet been accepted as combining the advantages of each in common, and applicable to all cases. His preference has been "in favour of returning the stump whenever it was practicable to do so, and of closing the abdominal section. The silk ligature, in its ready application, presented many advantages over the silver wire, but I have used chiefly the metallic suture in preference, regarding its use as attended with less risk afterward. The method, as practised by Dr. Sims, of securing the pedicle by means of a series of interrupted silver sutures, I have used several times, and considered it a great advance. I found, however, that without the pedicle was a thin one, troublesome oozing of blood frequently occurred from the tissues becoming lacerated in the tract of the sutures, as a consequence of the tension exerted in an opposite direction, as each loop in turn was twisted.

"October 18th, 1869, at the Woman's Hospital, I removed, from a patient thirty-three years of age, a multilocular ovarian tumour, weighing forty-five pounds, which had been of some two years' standing. As a large portion was nearly solid, the section had to be extended for several inches above the umbilicus before the mass could be removed. Chronic peritonitis had existed, but the adhesions were slight, except at one point, to the omentum. The left ovary was found involved with a long and rather thin pedicle.

"My friend Dr. Sims kindly introduced the sutures for me by his method, but unfortunately some oozing took place from the splitting of the tissues, as has been my previous experience; but after some delay it was controlled by the introduction of a parallel row of interrupted sutures, so as to secure the angles of the lacerations. This patient, however, rapidly recovered, and was discharged cured, November 29. Realizing that this difficulty must frequently occur when the pedicle was thin and small, I resorted to a different method of applying the wire, as illustrated in the following case:—

"Mrs. S., aged twenty-eight, a native of New York, was admitted to the Woman's Hospital Nov. 25th, 1869. She had married at fifteen, and was the mother of four children. The first child was born two years and four months after marriage, and the last two years and eight months previous to admission. She had been in good health until the latter part of December, 1868, when the abdomen began to enlarge rapidly, with frequent and painful micturition, while

she suffered at the same time from constant pain in the back and left inguinal region. The enlargement was so rapid, that at the end of two weeks after it was first noticed she was unable to wear any of her clothing which had previously fitted her, her appetite began to fail, and she soon became emaciated. Before the end of February the tumour had enlarged nearly, as she stated, to the size presented at the time of admission. The catamenia, which appeared first at the age of fifteen, and had always been regular previous to this time, became now irregular, and of short duration, until it ceased in the following May." Just previous to admission she had arrived from New Mexico. She was much emaciated, with œdema of the lower extremities, but cheerful, and very hopeful of a favourable result from surgical interference. A large multicellular ovarian tumour filled the abdomen, extending up to the sternum, and causing the false ribs to bulge outward to a great extent. The circumference of the abdomen, on a level with the umbilicus, was fifty-two and a quarter inches. The distance from the ensiform cartilage to the umbilicus was thirteen and a half inches, and to the pubis twenty-five inches. From the left anterior superior spinal process to the umbilicus was fifteen and a quarter inches, and on the right side fifteen inches. The mobility of the tumour was but partial. Edema of the abdominal wall, with much thickening of the tissues, existed from the pubis nearly to the umbilicus. The linea alba was well marked, with an unusual number of superficial dilated veins distributed over the abdominal surface. The whole abdomen was dull on percussion, with fluctuation easily detected at every point, yet varying greatly in distinctness. The uterus was high up in the pelvis, somewhat forward, but movable, and its cavity of a normal depth. Urine normal, as were also the heart and lungs; the pulse weak, ninety-eight. Tongue clean, bowels regular as a habit, but the skin dry and inactive.

"Her condition from the distension rendered an early operation imperative, and in fact the lesser evil, although much enfeebled after so long a journey, and unacclimated. The preparatory treatment was completed in a week, and consisted of a Turkish bath every other day, with five grains of inspissated ox-gall in the form of a pill, three times a day. On the third day a dose of castor oil was administered; and on the night previous to the operation a large enema of hot water, into which a portion of ox-gall had been dissolved, was thrown into the rectum, while the patient was placed on the knees and elbows. Her diet had been carefully regulated to be as nutritious as possible, in a small bulk, and consisted chiefly of strong beef-tea. Her condition improved soon in a marked degree. The œdema of the extremities was removed by rest and bandaging, and she no longer suffered from the great distension after the thorough cleaning out of the bowels, while her skin, from the use of the Turkish baths, had become soft, and in excellent condition."

On the 1st of December, 1869, Dr. Emmet performed the following operation in the presence of a number of gentlemen: "An incision of some six inches was made midway between the umbilicus and pubis through the linea alba, which was very distinct in consequence of œdema of the surrounding tissues. On reaching the peritoneum it was found firmly adherent to the tumour in every direction. The main cyst, together with several others, was emptied through a common opening. By degrees the adhesions were carefully stripped off from the surface of the tumour itself, using chiefly the finger-nails for the purpose. The adhesions extended from about four inches above the pubis to the diaphragm, and from five to eight inches on either side of the median line. To facilitate their separation it was necessary to extend with scissors the abdominal section upward and to the left of the umbilicus, until it reached fourteen inches in length. Although the hand was introduced into the main sac, and an attempt made to break down into it the numerous small cysts, it was found impossible to empty but a small portion of them, and with difficulty the mass was finally removed through the extended abdominal opening. The tumour was from the left of the uterus, with a thick pedicle three inches in width. The right ovary and uterus were in a healthy condition. The ether was administered by Dr. Perry, and the case required the most careful watching, as several times during the operation the shock was so great that stimu-

lants had to be resorted to. The tumour was removed at the end of an hour and a quarter. As the mass was held up, a clamp taken from one of Chapman's ice-bags, was placed on the pedicle as close to the tumour as possible, when it was severed by scissors. A section of stout silver wire (No. 25) had been prepared, about eighteen inches in length, to each end of which a common coarse sewing-needle had been soldered, after bending a portion of the wire into each eye. In the grasp of the clamp the pedicle had been spread out to its full width, and as it was held up, the ligature was introduced in the following manner: Below the clamp a needle was passed through the pedicle about an inch from its edge, but before its withdrawal the needle in the other hand was inserted along its course from the opposite direction. The two needles were thus drawn through, in the same manner as the shoemaker's stitch, and at the same time the wire was tightened around the included section as much as could be done, in consequence of the proximity of the clamp. The needles were introduced again in the same manner, so as to divide the pedicle into three sections. With the ends of the wire in one hand, the pedicle was seized between the grasp of the thumb and forefinger of the other hand, and at the instant of removing the clamp, by traction on the wire, the parts were drawn up tight together in two sections, while all bleeding from the third one was controlled by pressure of the thumb until the ends of the wire could be twisted. The ends of the wire were seized about an inch from the pedicle in the grasp of a pair of forceps, and carefully twisted over Sims' shield, to a point at which the integrity of the wire was still unimpaired. The twisted portion was cut off at half an inch in length, and bent over flat along the course of the ligature, so that the end was perfectly protected at the bottom of a deep sulcus. This ligature was applied in far less time than a clamp could have been adjusted, with perfect control of all bleeding, and to a pedicle which, from its size, would have been difficult of management in any other manner. So perfect was the compression, as the wire was tightened the tissues retracted from the bloodvessels, so that they projected a quarter of an inch beyond the plane of the divided surface which had been in common.

"Although the adhesions had been stripped off so extended a surface, no oozing of blood took place afterward, except high up in the vicinity of the spleen, where the adhesions could not be separated from the tumour with the same care, in consequence of the difficulty in bringing the parts fully in view. To the bleeding points the fluid extract of ergot was applied, but it proved valueless as a styptic, and afterward the persulphate of iron was brushed over the surfaces, but in small quantities, to avoid the formation of an insoluble clot.

"The external wound was closed by fifteen interrupted silver sutures, and were introduced far back from the edges, so as to include the peritoneum. As the oozing had not entirely ceased, high up on the left side a quantity of cotton was formed into a compress, so as to press the relaxed abdominal wall, at that point, well up under the ribs: this pressure, it being thought, would be sufficient to control all bleeding. Over the whole a broad bandage was applied, and she was placed in bed, with artificial heat around her. Immediately before the operation she was weighed on a platform scales, and her weight, with that of her clothing and the table, ascertained. She was placed on the scales after the operation, and it was found that she had lost sixty-nine pounds. The accuracy of this method was tested by carefully weighing the fluid and the mass taken away, with a difference of less than two pounds, which had doubtless been lost in the sponging. Immediately after the operation her pulse was 120 and very feeble, but reaction came on promptly. At 10 P.M., as she was restless and complaining of pain in the back, a teaspoonful of McMunn's elixir of opium was given by the rectum, and she passed a comfortable night. The sutures were removed December 7th, and the union was found complete. December 9.—To this date her convalescence had been slow, but without any interruption. Small circumscribed abscesses now formed at the entrance and exit of the abdominal sutures. Their formation was evidently due to the diminished vitality of the tissues consequent upon the œdema and distension to which the parts had been subjected by the enormous size of the tumour. December 10th, pulse 108. Up to this time no alcoholic stimulants had been found necessary,

but were now ordered. During the night of December 12th, was seized with severe cramps involving the muscles of the inner part of the thigh, and afterward in the calf of the left leg and foot. Large doses of opium were found necessary to relieve her suffering. Next morning the leg to the ankle was swollen from œdema, with an increased temperature of the parts. The limb was carefully bandaged, and in twenty-four hours she was entirely relieved. She began to recover rapidly, and in ten days the abscesses had healed. January 7th, 1870, she was discharged, having fully recovered."

Active principles of Gelsemium Sempervirens, with a Case of Fœtal Poisoning by three drachms of the Fluid Extract of the Plant.—Dr. THEODORE G. WORMLEY, Prof. of Toxicology in Starling Medical College, Ohio, having been solicited to make an examination of the contents of the stomach of a woman who had died after taking the fluid extract of gelsemium, thought it necessary as a preliminary to institute a series of experiments in order to ascertain whether that substance, as prepared by Tilden & Co., contained any principle or principles by which its presence could be certainly determined. These experiments are detailed in the *American Journal of Pharmacy* for January, 1870, and they show according to Dr. G. that the fluid extract of gelsemium prepared by the above firm contains a new organic acid, which he names gelseminic acid, and a strongly basic or alkaloid principle, which, being the active principle of the drug, he names *gelseminine*, *gelseminia*, or *gelsemia*.

The case of poisoning which instigated these investigations was as follows: "On the 30th of January, 1869, three teaspoonfuls of the fluid extract were administered to a young healthy married woman several weeks advanced in pregnancy, who at the time complained of no serious illness. In two hours after taking the dose, the patient complained of pain in the stomach, nausea, and dimness of vision. These symptoms were soon succeeded with great restlessness, ineffectual efforts to vomit, and free perspiration over the body. At the expiration of about five hours the pulse was found feeble, irregular, and sometimes intermittent; there was great prostration, with irregular breathing and slow respiration. The skin was dry; extremities cold; the pupils expanded and insensible to light; the eyes fixed and inability to raise the eyelids. The vital powers rapidly gave way, and, without convulsions, death occurred in about seven hours and a half after the poison had been taken.

"It will be observed that in this case, only three teaspoonfuls of the fluid extract were taken. Presuming it to have had about the same strength as the preparation we examined, the quantity of the alkaloid contained in this amount could not have much exceeded the sixth part of a grain. This would seem to indicate the alkaloid to be one of the most potent poisons at present known.

"*Post-mortem appearances.*—Eight days after death the body presented the following appearances, as described by Dr. J. H. Stephenson, who made the autopsy and to whom I am indebted for the account. Countenance natural as in sleep. No emaciation, and body in a perfect state of preservation. Cadaveric rigidity very slight. The back of the neck and between the shoulders, extending the full length of the spine, as also the depending parts of the thighs and arm to the elbows, presented a congested appearance. The membranes and substances of the brain and medulla oblongata were normal. The adipose tissue remarkably thick, and highly tinged throughout with bilious matter. Lungs slightly collapsed, natural in appearance, and superficial veins congested. Heart normal in size, superficial veins injected, and the cavities greatly distended with dark grumous blood, inside of which was found a well-defined membrane, identical in appearance with that found in diphtheria and pseudo-membranous croup. The abdomen presented no tympanitic distension. Stomach slightly distended with gas, and contained a small quantity of ingesta. Peritoneum and intestines in a healthy condition. Liver and investing membrane normal; left kidney congested. The uterus was slightly enlarged and contained a fœtus of about five weeks' development.

"A small quantity of the contents of the stomach having escaped from the organ at the time of the dissection, was collected separately in a small bottle; the stomach with the balance of its contents was placed in a larger bottle.

These bottles, with their contents, were carefully sealed and remained undisturbed until the 17th of May. At this time the contents of the bottle containing the stomach were found to have undergone considerable decomposition. A little pure alcohol was added to the decomposing mass, and it was then allowed to remain until the 13th of June, when the chemical examination of the contents of both bottles was commenced.

"*Chemical analysis.*—The contents of the *small bottle*, consisting of about two fluidrachms of liquid with a small amount of solid matter, were digested with about one ounce of strong alcohol, the liquid then decanted, and the solids washed with fresh alcohol, which was collected with that first employed. The alcoholic liquid was now concentrated at a moderate temperature to about one-half its volume, then filtered, and the filtrate concentrated to about one drachm of fluid. This concentration caused the separation of some oily globules, and also of some apparently vegetable solid matter, and the mixture exhaled a very marked vegetable odour, very similar to that of the extract of gelseminum under similar conditions.

"The concentrated liquid thus obtained was again treated with alcohol, filtered, and the concentrated filtrate treated with about half an ounce of pure water, which left considerable matter undissolved, and furnished, when filtered, a clear slightly yellowish solution. This aqueous solution was concentrated to a small volume, filtered, the filtrate acidulated with a few drops of acetic acid and then extracted with two volumes of pure commercial ether. On allowing the ethereal liquid to evaporate spontaneously, it left a nearly colourless residue containing several groups of crystals, similar in appearance to those of gelseminic acid.

"A portion of this residue, when examined in its solid state by nitric acid and ammonia, and another portion when dissolved by the aid of an alkali and the solution tested by several reagents, presented the chemical and fluorescent properties of gelseminic acid in a degree indicating the presence of a very notable quantity of the acid. The contents of the small bottle were not examined for the alkaloid.

"The contents of the *stomach* were treated and purified after the general method described above, and the final aqueous solution acidulated with acetic acid and extracted with ether, for the purpose of recovering the organic acid, if present; the solution thus extracted was then rendered slightly alkaline and extracted by chloroform, for the purpose of recovering the alkaloid. The purified ether extract revealed very satisfactory evidence of the presence of the organic acid, both in regard to its fluorescent and chemical properties. So, also, the chloroform extract, when purified and the final aqueous solution concentrated to a very small volume and examined by several reagents, furnished undoubted evidence of the presence of the base, indicating it, however, to be present only in very minute quantity."

On comparing the intensities of the reactions of the several reagents applied with those obtained by the same reagents from solutions of the alkaloid of known strength, it was inferred that the quantity of the base recovered in this case did not much, if any, exceed the fiftieth part of a grain. The quantity of the alkaloid originally taken, as we have already seen, did not probably much exceed the sixth of a grain.

The fact that the stomach with its contents had undergone considerable decomposition, and also that the chemical examination was not made until some months after death, would seem to indicate that the poison is not readily destroyed by decomposition, and that it may be recovered after comparatively long periods, even when taken only in small quantity.

Removal of the entire Clavicle for Osteosarcoma.—Dr. F. CORLEY, of Kansas City, Mo., records (*St. Louis Med. and Surg. Journ.*, Jan. 1870) a case of a man, æt. 30, from whom he successfully removed the entire left clavicle for osteosarcoma. At the last report, about nine weeks after the operation, the patient had recovered and was attending to business.

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FEES.—The fee for instruction during the Summer Session, from March to November, is \$100; for the Winter Lectures, \$121. The fee for the entire year, for the Winter Lectures as well as for the Summer Session, is \$200. The fee for Graduation is \$30. The fee for Matriculation is \$5. This is appropriated to the increase of the Library, and is to be paid to the Dean once by all who desire to become members of the College.

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REMARKS. A detailed account of the Winter and Summer Sessions, as well as of the Harvard Dental School, will be forwarded (post-paid) by DAVID CLAPP & SON, 334 Washington Street, Boston. The Janitor of the College will advise students in the selection of boarding places, and will always have a list of such as are in the vicinity of the College Building, varying in their rate of charges. Students are invited, on coming to town, to call upon the Dean of the Faculty, 114 Boylston Street, to whom all letters must be addressed.

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Lectures and Examinations daily during April, May, June, and September.

EXAMINATIONS.

ANATOMY,
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MATERIA MEDICA,
PRACTICE OF MEDICINE.PHYSIOLOGY,
OBSTETRICS,

REGIONAL ANATOMY.—Lectures and Demonstrations by H. Lenox Hodge, M. D.

PERCUSSION AND AUSCULTATION IN DISEASES OF THE LUNGS AND HEART.—Lectures and Clinical Examination of patients, by James H. Hutchinson, M. D.

DISEASES OF THE EYE AND EAR.—Lectures upon the Anatomy, Physiology, and Diseases of the Eye and Ear, by George C. Harlan, M. D.

URINARY DEPOSITS AND TESTS.—Students will be instructed in the microscopical and chemical examination of the urine, and will be enabled to make themselves familiar with the necessary manipulations, by James H. Hutchinson, M. D.

DISSECTIONS AND SURGICAL OPERATIONS may be practised by the members of the class to the best advantage. The tables are covered with slabs of Slate. The subjects are injected by Hydraulic pressure. The apartments are clean, and private closets may be obtained.

CLINICAL INSTRUCTION.

PENNSYLVANIA HOSPITAL.—The advantage of attending the Lectures, Operations, and Clinical Examinations of patients at this important hospital will be secured without charge.

CHILDREN'S HOSPITAL.—Much of a physician's practice being among children, it is essential that their various disorders should be seen by the student. Drs. Hodge and Cheston will, during the session, have charge of the numerous out-door and in-door patients of this establishment, and will offer every facility to the class.

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Clinical Instruction is provided for them at the Pennsylvania Hospital, Philadelphia Hospital, Children's Hospital, and Wills Hospital for the Eye.

Bed-side Instruction during February, March, and April, is given them in the wards of the Pennsylvania Hospital by Dr. JAMES H. HUTCHINSON.

WINTER COURSE OF EXAMINATIONS will begin with the Lectures at the University of Pennsylvania in October, and will continue till the close of the session.

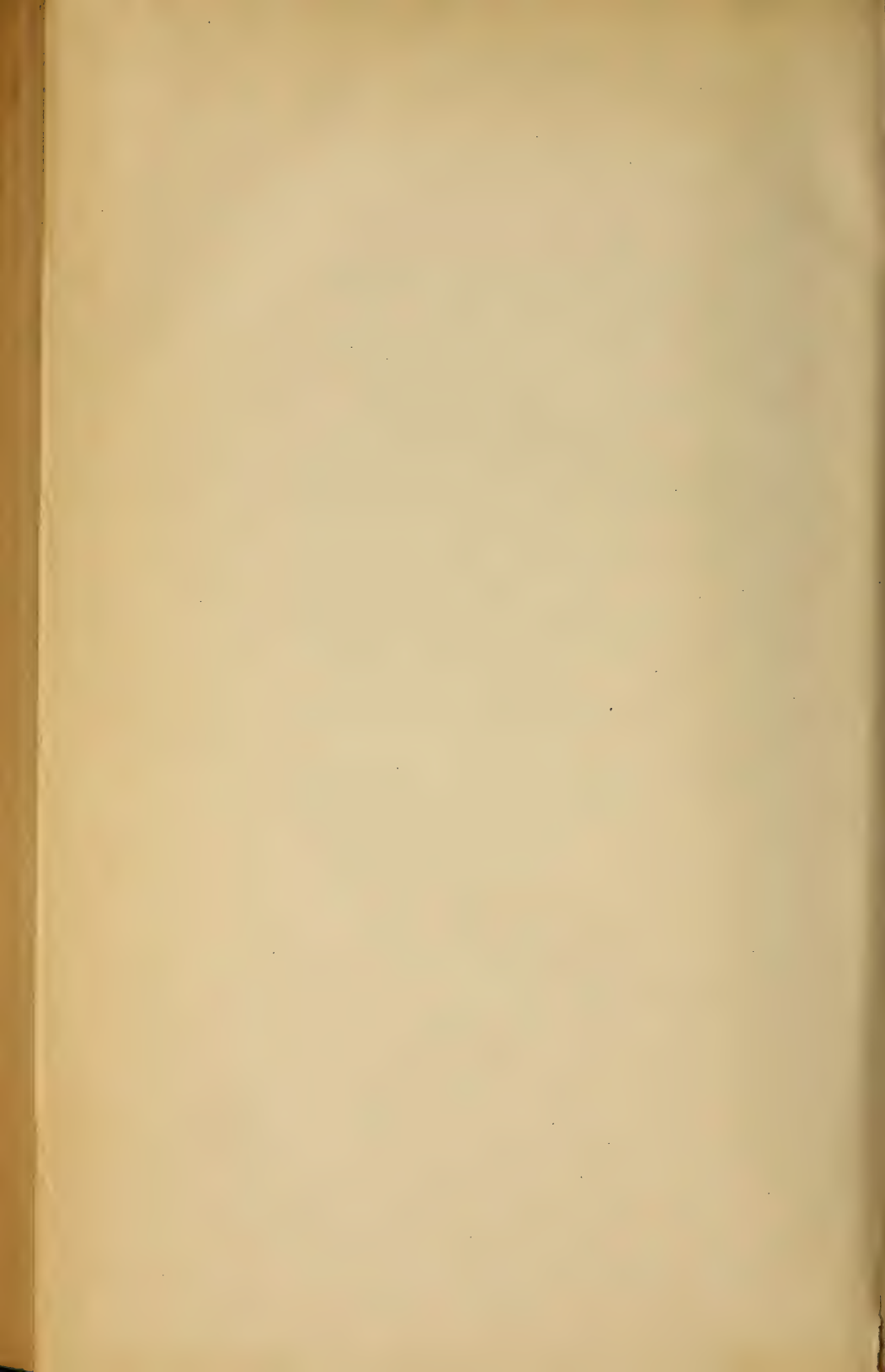
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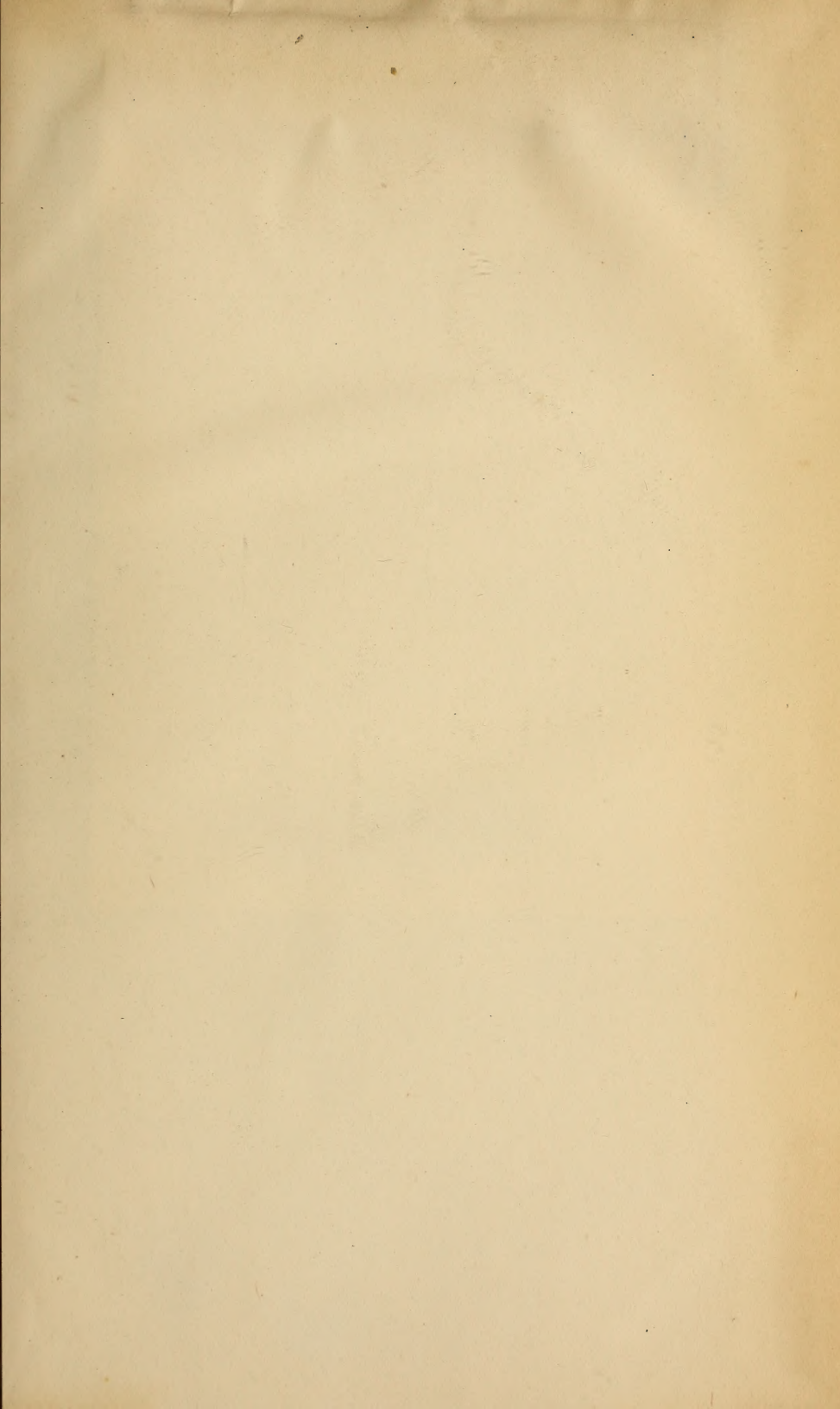
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